LONG RANGE FACILITIES PLANNING

PLAN GUIDE LINES

VOL. I OF V

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NATIONAL STEEL AND SHIPBUILDING COMPANY
A MORRISON-KNUDSEN COMPANY

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NATIONAL SHIPBUILDING RESEARCH PROGRAM

SP-1 FACILITIES PANEL PROJECT

LONG RANGE FACILITIES PLANNING

PLAN GUIDE LINES

VOL, I OF V

NATIONAL STEEL AND SHIPBUILDING COMPANY

IN COOPERATION WITH THE

DEPARTMENT OF TRANSPORTATION

MARITIME ADMINISTRATION

APRIL, 1982

PLAN GUIDE LINES

Volume I

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LONG RANGE FACILITIES PLAN

MISSION STATEMENT AND PRIMARY OBJECTIVE

The main objective of the Long Range Plan is to provide and maintain a new ship construction facility with The flexibility to build any mix of ships from 100 percent commercial (crude and product carriers, bulkers, OBO'S, containerships, RORO's, etc.) to 100 percent Navy non-combatants.

The facilities will provide the capabilities for increasing ship repair work to serve as a counter-cyclical activity to new construction.

The facilities will provide optimum flexibility for doing other-than-ship heavy steel construction, especially in the event of a downturn in new ship construction.

Maintain a stable, well trained labor force for the efficient manufacturing of new-ship and other heavy steel products.

The long term objective in laying out the yard' and in providing facilities is to achieve optimum flexibility for the economical construction of a wide variety of commercial and Navy vessels. Also, in the event of a national emergency, have the capabilities to mobilize quickly and effectively to meet the nation's defense needs.

YARD HISTORY

National Steel and Shipbuilding Company is the largest shipbuilder on the west coast. NASSCO has been in the marine business since 1945; the company has expanded several times to its current size of 147 acres. Current shipbuilding activities include both Navy and commercial vessels, with a significant amount of Navy repair and overhaul work for the Pacific fleet, which makes its home port in San Diego. The following is a brief history of NASSCO's growth.

1905 Business established-California Iron Works operated as a foundry and machine shop.

1922 Name changed to National Iron Works. Operation expanded to include steel fabrication.

1938 National Iron works purchased the Ingle Manufacturing Company to expand its scope of operation to include industrial and marine ranges.

1945 National Iron Works entered the shipbuilding field and launched its first 52-foot tuna boat.

1948 The adjacent Lynch Shipbuilding Company-was purchased to expand the shipbuilding business.

1949 Name was changed to National Steel and Shipbuilding Corporation.

1951 First military contract.

1957 NASSCO purchased the adjacent Martinolich Shipbuilding Company to further expand shipbuilding activities.

1962 Ownership by two principals: Morrison-Knudsen Company and Kaiser Industries.

1966 Received largest Navy fixed-price contract award in peacetime history for 17 LST's.

1973 Entered into the large commercial tanker field.

1976 Completed a major facilities expansion and modernization program.

1979 December 3, NASSCO became a sole subsidiary of Morrison-Knudsen Company.

HISTORY OF LONG RANGE FACILITY

PLAN DEVELOPMENT

January ‘78	Norfolk, Virginia. At a meeting of Sp-1, the Maritime Administration invited Richard M. Muther to address the group on the subject of long range facility planning.
January ‘79	Atlanta, Georgia. A week-long seminar sponsored by MARAD was given to train facility planners from United States shipyards in the Muther techniques of long range facility planning.
May ’79	NASSCO submitted a contract proposal to MARAD for cost sharing the development of NASSCO’s Long Range Facility Plan.
July '79	Richard M. Muther addressed NASSCO’s executives to explain his methodology and from that meeting a "Mission Statement” was developed.
April '80	Contract awarded by MARAD.
May '80	Tour of United States shipyards by NASSCO facility planners.
October '80	First draft of the Long Range Facility Plan presented to top management.
December ’80	Second draft of the Long Range Facility Plan presented to top management.
January '81	Second draft of Long Range Facility Plan put into final form.
February '81	Second draft of Long Range Facility Plan Alternatives presented to NASSCO’s Board of Directors.
March '81	Request for six month extension on L.R.F.P. contract to allow for top management decision on L.R.F.P. direction.
May ’81	Selection of alternative five (ITT and adjoining 20 acres) for further development.

June '81 - Negotiations started to gain option on ITT ' site and favorably completed in early July. (Option good until December 31, 1981.)

July '81 - Request for second six month extension on L.R.F.P. contract. Time required to allow LR - Planning for satellite operation.

August '81 - Started LR -Plans for new NASSCO South yard and phase in requirements to complement main yard operations. Conceptual expansion plans presented to Morrison-Knudsen Board of Directors NASSCO's parent-company).

September '81 - Preliminary report published, defining the direction to be taken in developing the new NASSCO South yard.

October ’81 - South yard development plans finalized for the November Morrison-Knudsen Board meeting.

December ’81 - Plans for South yard scrapped due to high interest rates, the general state of the economy and an expected decline in potential Navy contracts amid federal budget-tightening.

January ’82 - Yard capacity study indicating potential through-put bottlenecks finalized and published.

April '82 - Long Range Facility Planning (LRFP) contract with MARAD completed.

NASSCO’s Long Range Facility Plan has become a way of life. It will continue to be the guiding light for present and future capital projects.

LONG RANGE FACILITIES

PLANNING ASSUMPTIONS

1. NASSCO will continue in the new ship construction business of non-combatant Navy vessels and Merchant Marine ships in the 28,000 - 190,000 DWT range, 1OO percent either way, or any mix of both.

2. Flexibility will be provided so that combatant type Navy vessels could be constructed in the future if so desired.

3. Flexibility will be provided so that other-than-ship heavy steel construction can be undertaken:
   For special contracts such as off-shore drilling rigs.
   For general heavy construction work to keep the yard operating in the event of a downturn in new ship construction.

4. NASSCO has experienced a growth patten of approximately five percent a year and in the long run has the potential of continuing this pattern. However, due to the highly cyclical nature of the business, the current short range projection is in a contraction of the base business.

5. There will be substantial changes in ship construction methods during the next 10 - 20 years. For example:
   - The sizes and weights of sections constructed away from the Building Ways and Building Dock and to be hoisted into those areas will increase in tonnage. These will be limited by the size of cranes available that the ground can support.
   Pre-outfitting of pipe work, sheetmetal and the-like is in its infancy. This will become the norm and will be done in increasing amounts.

6. Construction time on the Ways and in the Building Dock will be reduced to provide faster throughput, and to allow the projected growth in “Equivalent Ships” to be met up to double the present volume. This can be met, through improvements in construction methods, with the present Building Ways 2, 3 and 4 and Building Dock 1.

7. There is a major move to change steel buying and storage procedures. Plate sizes will he rationalized and standardized to reduce costs, simplify storage, ease plate picking for orders and reduce the space required for steel storage.

8. Berths 2, 4, 5 and 6 are the only ones which can effectively be used for outfitting. Berth 3 is short, is usually blocked by Berth 2, and is not considered to be a practical outfitting position. Berth 1 is also not practical because it is in the way of the Building Dock. Berths 7 and 8 are small barge berths only and not practical for outfitting. Berths 9 and 10 are not served by crane and they are only suitable for repair work.

9. The small floating drydock lease expired October 1981 and was not renewed. This is of minor consequences since the capacity is limited to 2,600 tons with a shallow draft. We are assuming that, if the company plans to expand its repair capabilities, a substantially larger capacity drydock will be required.

10. An adequate labor force will be available for the foreseeable future.

11. NASSCO will continue basically as a heavy steel constructor and ship builder. We are assuming that the company will. not get into the major use of aluminum, exotic metals or fiberglass for its major construction work.

12. Because of the mild climate, we assume that the company will continue to do most of its heavy constriction work in the open air, not under roof.

1.3. General improvements in the use of direct and indirect hourly paid labor will continue at approximately the same rate as indicated in the ratio’s.

14. Technological improvements in all phases of ship construction and support work will. continue at approximately the same rate as during the last five years.

SECTION 11,

PRESENT AND FUTURE CAPABILITIES

NASSCO NEW CONSTRUCTION

CAPACITy STUDY

JANUARY 1982

BY: J. R. RUECKER

FACILITIES AND INDUSTRIAL ENGINEERING DEPT,

TABLE OF CONTENTS

1. INTRODUCTION

This report documents the primary facilities that could have an effect on yard throughput. The analysis of facility capabilities was undertaken as part of NASSCO's Long Range Facility Plan Development Program.

The facilities and their capabilities discussed in this document represent NASSCO as it was in 1981. As for the future, it will undoubtedly bring many changes for NASSCO. Tomorrow's products will have the potential of being different. Business will either grow or contract. Our market will vary. Processes must and will be improved. Supporting services will change. Operating times and working hours will alter. Therefore, the data in this report only gives us the potential capacity restrictions as they exist today.

The establishment of yard capacity has been based on those facilities which could have a major effect on new construction yard throughput. The data used to establish facility capacities was derived by averaging four capacity projections from different sources. This is covered in detail under the Capacity Development section of this report.

The major facilities capacities have been projected for three new construction scenarios; 100 percent commercial, 100 percent Navy and 50/50 commercial and Navy. The commercial work was based on a 50/50 mix of LaJolla and Ingram Class Product Carriers and the Navy work was based on a 75/25 mix of Destroyer Tenders (AD) and Cable Laying Ships (T-ARC-7). This mix of ships more or less is representative of our current and future new construction work. The Capacity Projections section of this report for the three scenarios list the major facilities with their maximum capacity for each scenario plus a capacity ranking. The capacity is the number of ships per year that a particular facility can support. The Capacity Ranking column gives a numerical indicator as to the effect that facility has on yard throughput. The number one (1) indicates that facility which would be the first to restrict

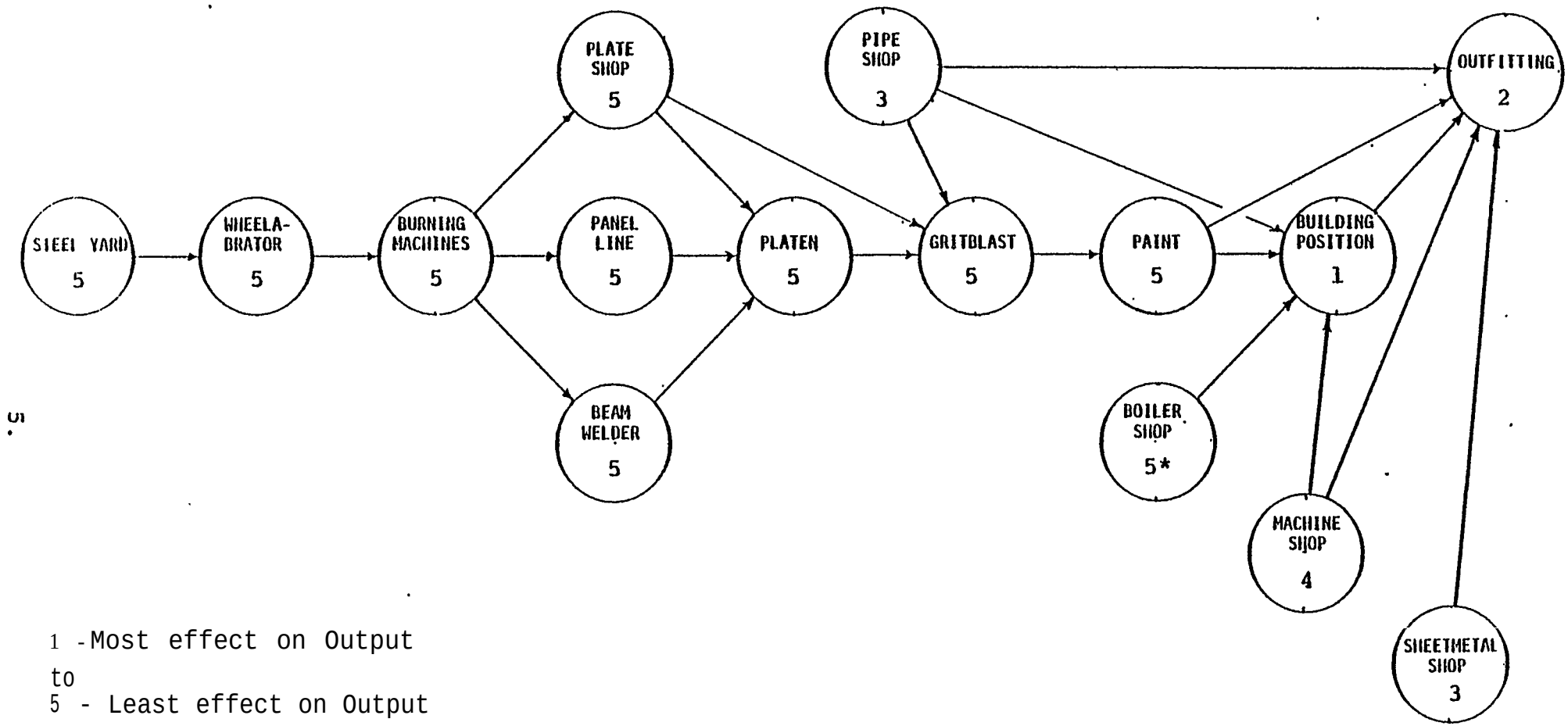
utput . Two (2) would be the second and so on. The Adjusted Ranking column is an extrapolation of derived data and personal input as to the effect these facilities could have on throughput. Again the number one (1) represents the worst case. It should be noted that the Adjusted Ranking does not necessarily represent the actual capacity rankings. For example, the Building Positions and Outfitting Berths have been given Adjusted Rankings of one and two respectively. Yet the majority of one's and two's in the Capacity Ranking columns apply to the Sheetmetal and Pipe Shop. The reasoning behind the shift in ranking is that additional capacity can be achieved *rather* easily by farming out sheetmetal and pipe work. On the other hand, additional capacity cannot be achieved in the same manner for the Building Positions or Outfitting Berths. In order to increase capacity for these two facilities a major change in construction techniques would be required and/or a large outlay of money for additional facilities would be required. Both would take a considerable amount of time before additional capacity could be achieved. It should be noted again that the Adjusted Ranking column is based somewhat on my Personal observations, therefore I suggest that each individual that reads this report draw his own conclusions based on the data presented.

11. CAPACITY PROJECTIONS

FOR

THE THREE SCENARIOS

CAPACITY CONSTRAINT RANKING



1 - Most effect on Output

to

5 - Least effect on Output

* Could become a 3 if ship propulsion goes back.to steam instead of diesels.

CAPACITY CONSTRAINT RANKING LOGIC

The major. new construction facilities have been ranked by the degree of effect they could have on increasing yard throughput . The ranking is on a scale of one to five with one having the most potential of restricting throughput and five having the least effect.

The preceding Capacity Constraint Ranking Graph illustrates all the major facilities and their rankings. The data on this graph represents the formulation of the yard capacity analysis. The following Capacity Protection Chart for the Three Scenarios lists actual vessel capacity per major facility under each scenario; 100 percent Navy work, 100 percent commercial work and 50/50 mix of Navy and commercial. This chart also includes two separate ranking systems, one for each scenario and facility, and the other which is a combination of factors. The later *ranking system is the one* upon which the Capacity Constraint Ranking Graph is based.

The facilities which can have the most influence in restricting yard throughput are the Building Positions and for that reason have been ranked number one. These facilities in the analysis actually indicated a ranking of being a second or third potential restrictor in comparison with Sheetmetal Shop and Pipe Shop. These shops actually have less influence on yard throughput than the Building Positions mainly because Sheetmetal or Pipe Shop work can be farmed out when capacity is reached and this cannot be done with a ship in a building position.

The second most crucial facilities are the Outfitting Berths. These facilities are very much like the Building Positions in that it is highly unlikely that a ship would be farmed out *for* outfitting. For this reason these facilities have been given a ranking of two even though the general ranking was in the four and five range.

The Pipe Shop and Sheetmetal have both been given equal billing as the third most crucial facilities related to yard throughput. Both these facilities received the majority of their ratings in the one's and two's. However, the final rating of three indicates less importance than the original ratings for several reasons. Both of

these shops can overcome capacity constraints rather easily compared to the Building or Berthing Positions. The methods to overcome capacity limitations would be to farm out work, redesign systems so they will accept off-the-shelf items (purchased parts), standardize material and assemblies, and introduce mechanization.

The Machine Shop has been given a rating of four. The shop has several large machines which are not normally found in local shops. For this reason it would be difficult but not impossible to overcome capacity restraints.

The remaining facilities have all been grouped into the fifth category. These facilities tend to have very little effect on capacity when matched with the capabilities of the Building. Positions. As long as the current building and outfitting techniques are used even the platens will have sufficient output capabilities. If the techniques changed and yard throughput increased substantially it would be very Likely that NASSCO'S ability to move and store material to support these facilities would fall *short.* During the analysis these two areas were addressed but insufficient data existed and the capabilities could not be projected.

CAPACITY PROJECTION CHART

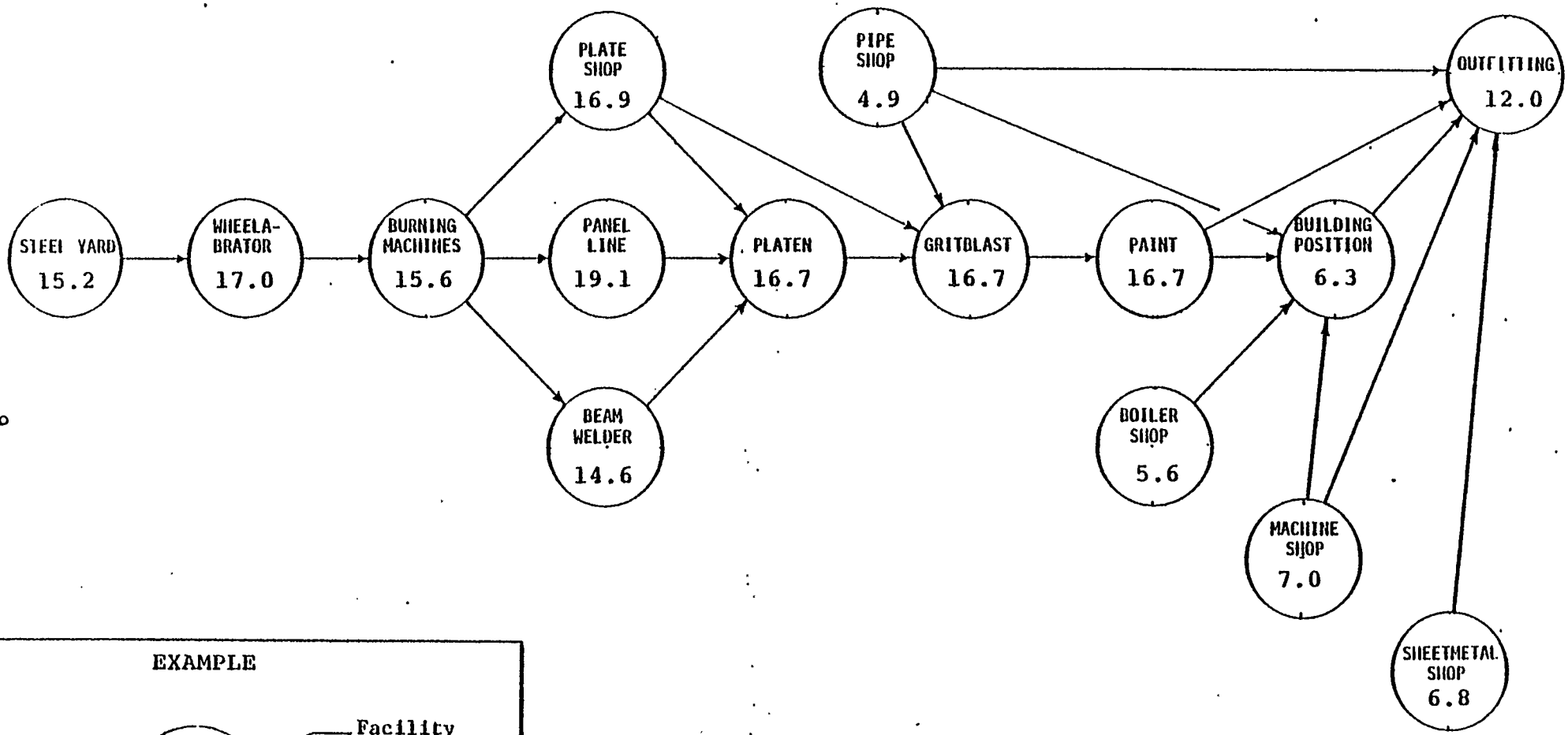
For The THREE SCENARIOS.

Major Facility	100% Navy		100% Commercial		50/50 Navy/Comm.		Adjusted Ranking
	Ships per Year	Capacity Ranking	Ships per Year	Capacity Ranking	Ships per Year	Capacity Ranking	
tfitting Berths	3.3	4	12.0	6	7.7	5	2
ilding Positions	2.2	2	6.3	3	4.3	3	1
int Area	6.4	7	16.7	10	11.6	8	
it Blast	6.4	7	16.7	10	11.6	8	
atens	6.4	7	16.7	10	11.6	8	
nel Line	7.3	10	19.1	13	13.3	12	
ate Shop	6.5	8	16.9	11	11.8	9	5
rning Machines	6.0	6	15.6	9	10.8	7	
am Welder	5.6	5	14.6	7	10.1	6	
labrator	6.6	9	17.0	12	11.8	9	
eel Yard	9.3	11	15.2	8	12.3	10	
iler Shop	5.6	5	5.6	2	5.6	4	
chine Shop	18.4	12	7.0	5	12.7	11	4
eetmetal Shop	.8	1	6.8	4	3.8	1	3
pe Shop	2.8	3	4.9	1	3.9	2	

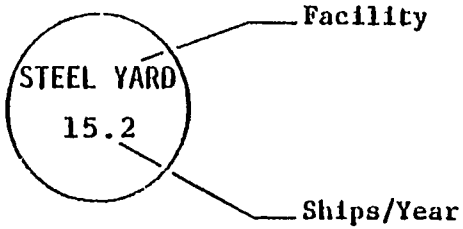
NUMBER OF SHIPS PER PER YEAR BY FACILITY

TYPICAL COMMERCIAL WORK (100%)

(50/50 **Mix Of I,PC's &** IPC's)

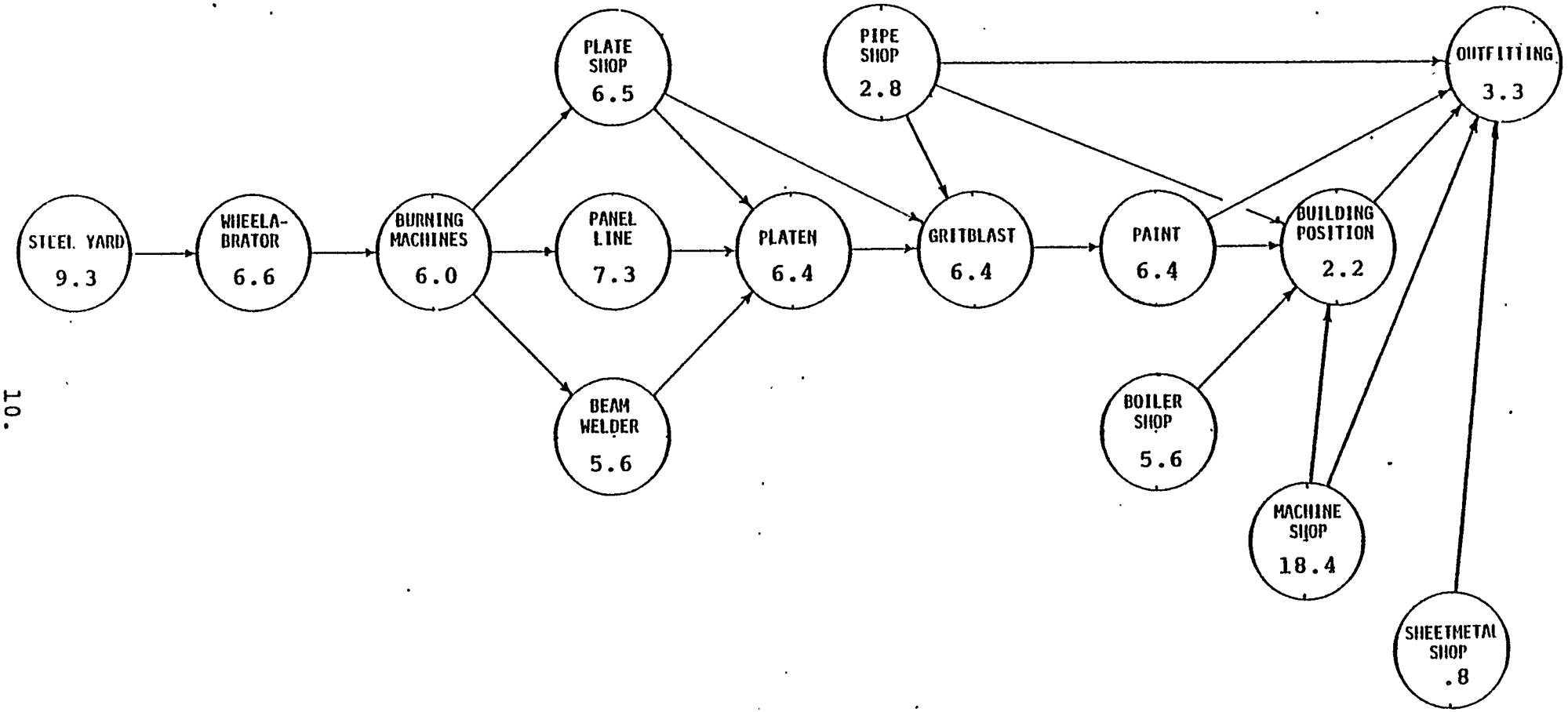


EXAMPLE



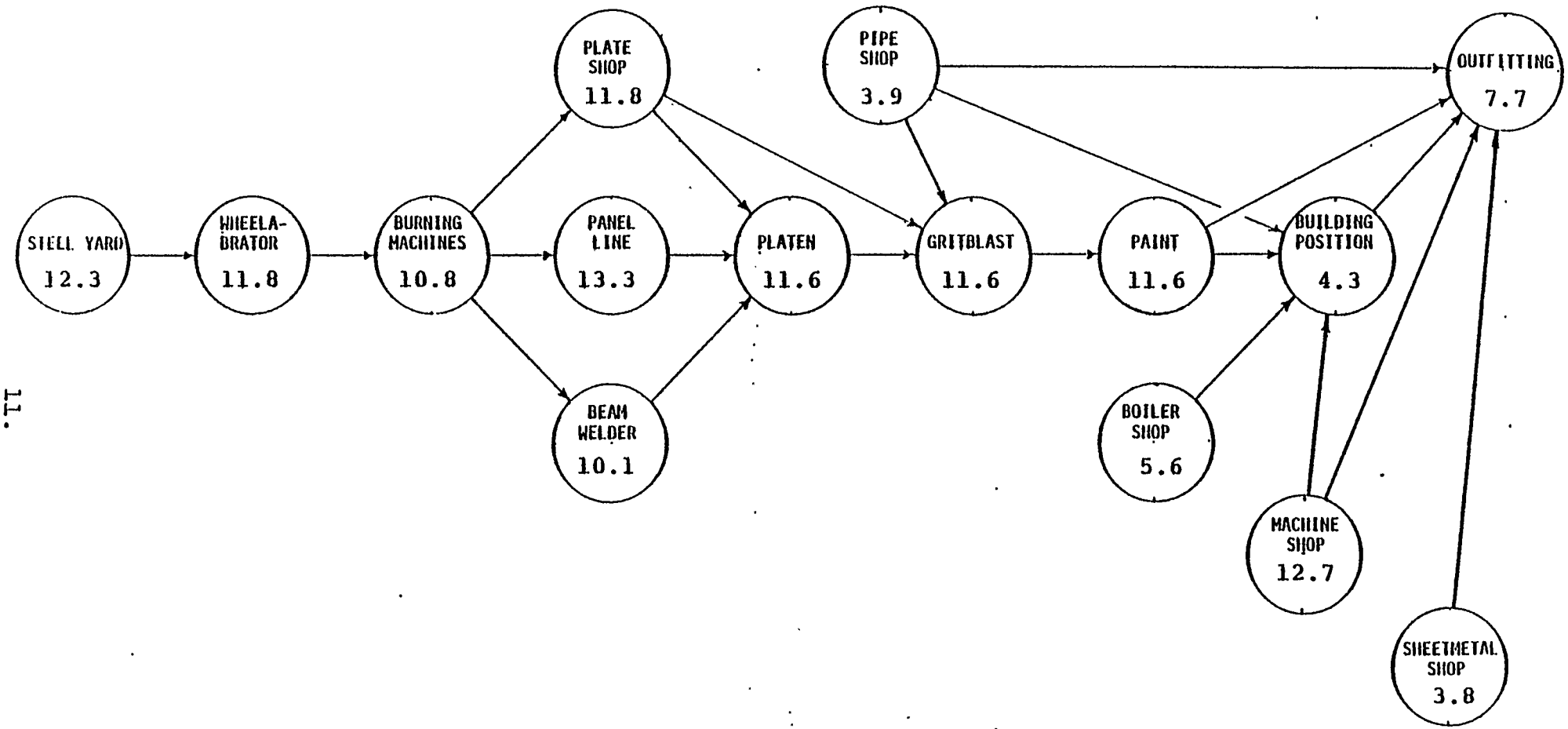
TYPICAL NAVY WORK (100%)

(75/25 Mix of AD's & T-ARC's)



NUMBER OF SHIPS PER YEAR BY FACILITY

50/50 Mix Navy & Commercial



III. POTENTIAL CAPACITY

BOTTLE NECKS

BY

VESSEL

POTENTIAL CAPACITY BOTTLE NECK MATRIX *

Major Facility	Capacity Indicator	NASSCO Built Vessels Since 1970											
		LST	AFS	AOR	AD	T-ARC	SCT	SDT	CPC	CT	OBO	LPC	IPC
Outfitting Berths	Varies	5.5	6.0	2.2	2.6	5.3	1.7	2.0	10.0	9.6	2.4	12.0	12.0
Building Positions	Varies	4.8	4.4	3.3	2.0	2.7	4.8	1.3	4.5	6.4	4.0	5.5	6.9
Paint	2350 Tons/Week	27.8	25.3	6.2	3.7	14.5	8.7	2.4	11.0	24.7	7.9	15.8	17.5
Grit Blast	2350 Tons/Week	27.8	25.3	6.2	3.7	14.5	8.7	2.4	11.0	24.7	7.9	15.8	17.5
Platen	2350 Tons/Week	27.8	25.3	6.2	3.7	14.5	8.7	2.4	11.0	24.7	7.9	15.8	17.5
Panel Line	2700 Tons/Week	31.9	29.0	7.2	4.2	16.7	9.9	2.7	12.6	28.3	9.0	18.2	20.1
Plate Shop	2375 Tons/Week	28.1	25.5	6.3	3.7	14.7	8.7	2.4	11.1	24.9	8.0	16.0	17.7
Burning Machines	2200 Tons/Week	26.0	23.6	5.8	3.5	13.6	8.1	2.2	10.3	23.1	7.4	14.8	16.4
Beam Welder	2050 Tons/Week	24.2	22.0	5.4	3.2	12.7	7.6	2.1	9.6	21.5	6.9	13.8	15.3
Wheelabrator	2400 Tons/Week	28.4	25.8	6.4	3.8	14.8	8.8	2.4	11.2	25.2	8.0	16.1	17.9
Steel Yard	2150 Tons/Week	25.4	23.1	5.7	3.4	13.3	7.9	2.2	10.0	22.6	7.2	14.5	16.0
Boiler Shop	Varies	Diesel	5.6	3.7	5.6	Diesel	5.6	4.8	5.6	5.6	5.6	Diesel	Diesel
Machine Shop	Varies	10.5	21.0	10.5	21.0	10.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Sheet Metal Shop	10 Pkg./Week	N/A	N/A	1.0	.5	1.5	12.5	12.5	5.6	12.5	12.5	6.8	6.8
Pipe Shop	8560 Lin.Ft./Week	3.6	3.4	2.3	1.6	5.7	3.2	3.1	4.6	3.6	3.5	4.9	4.9

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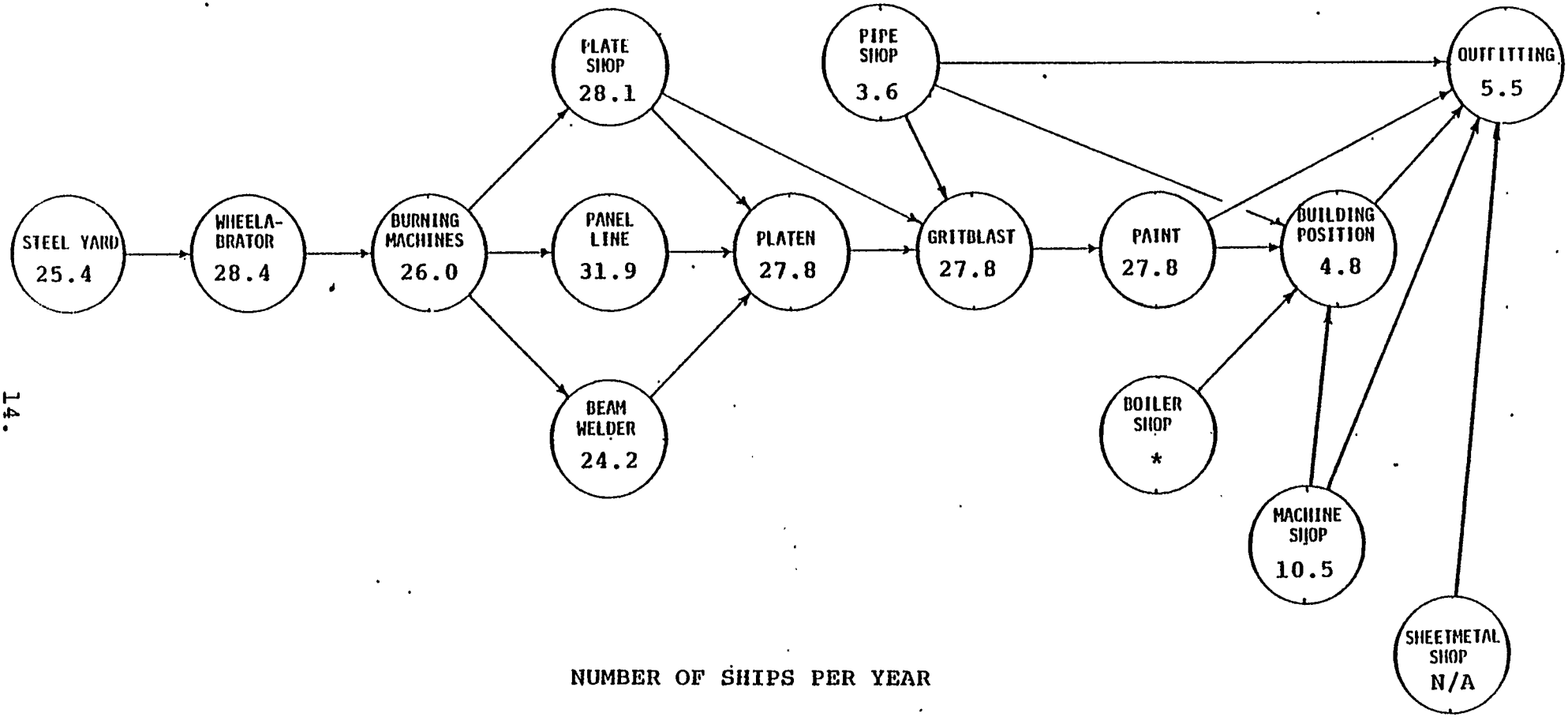

NUMBER OF SHIPS PER YEAR

* Diesel powered vessel, boilers not required.

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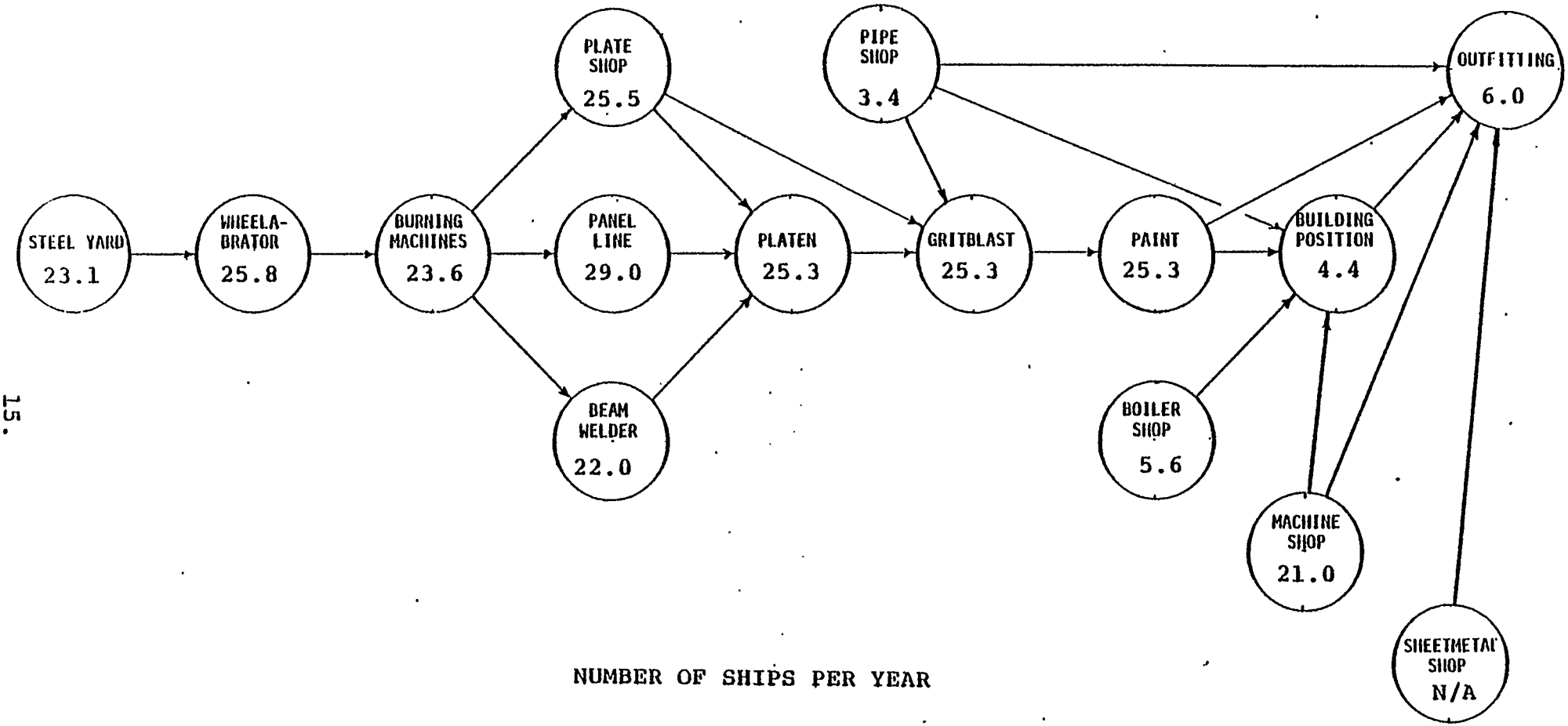

NUMBER OF SHIPS PER YEAR

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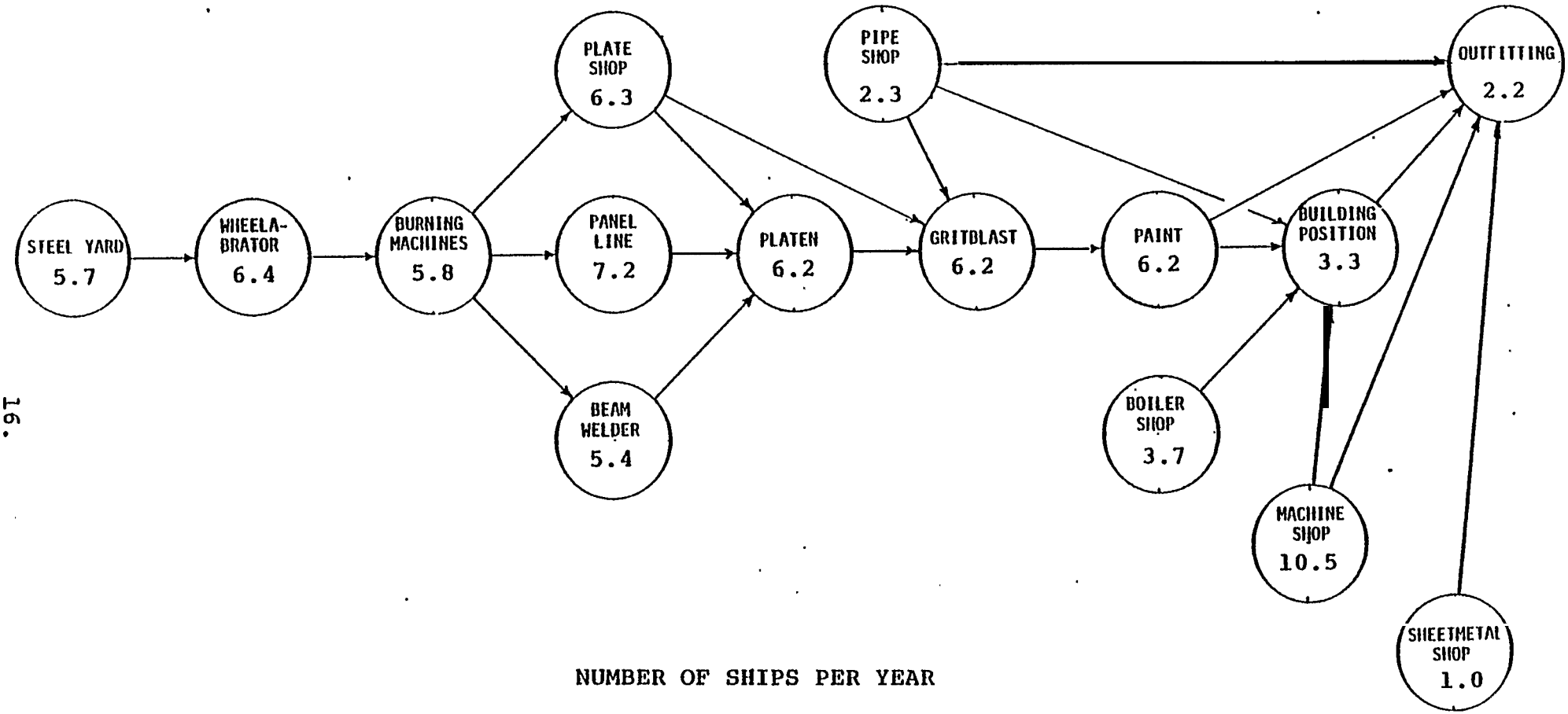
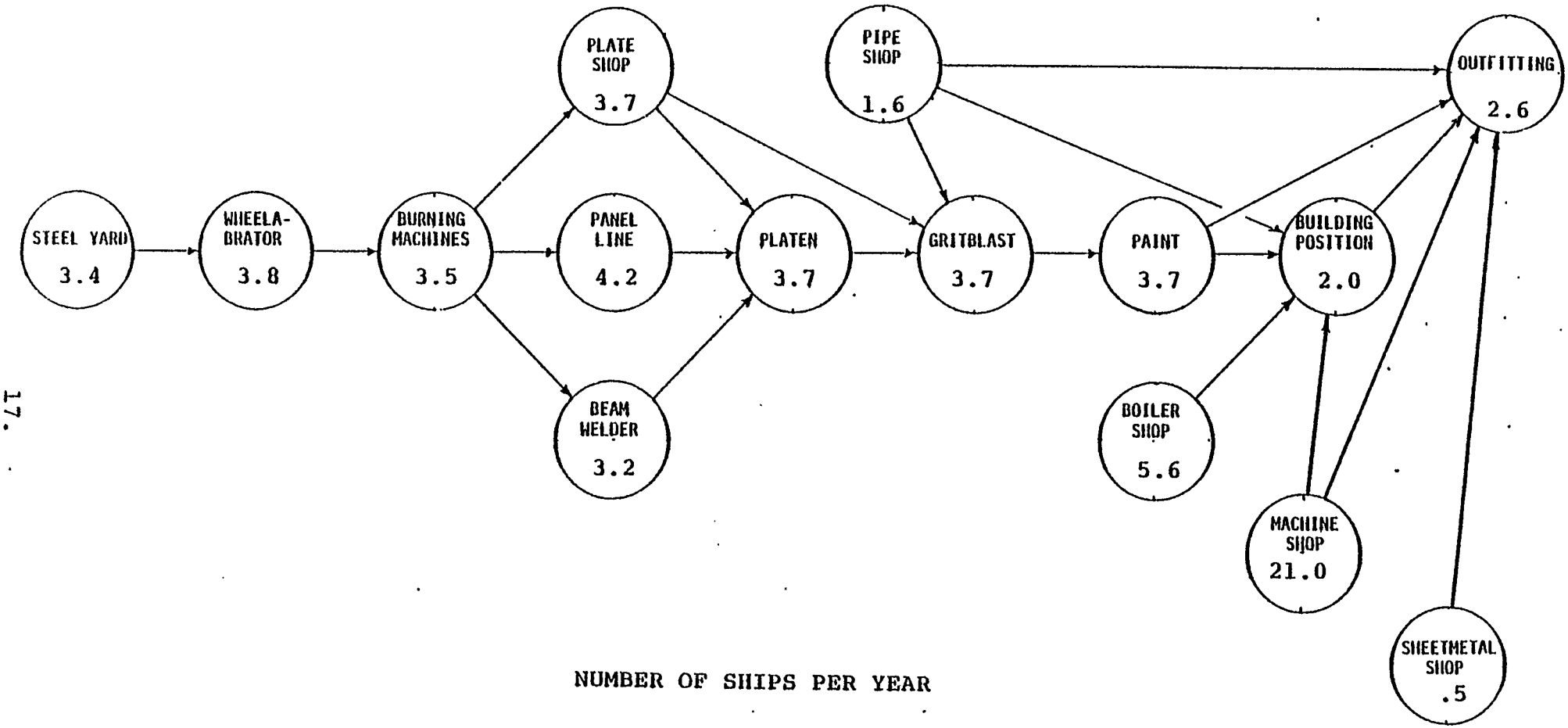
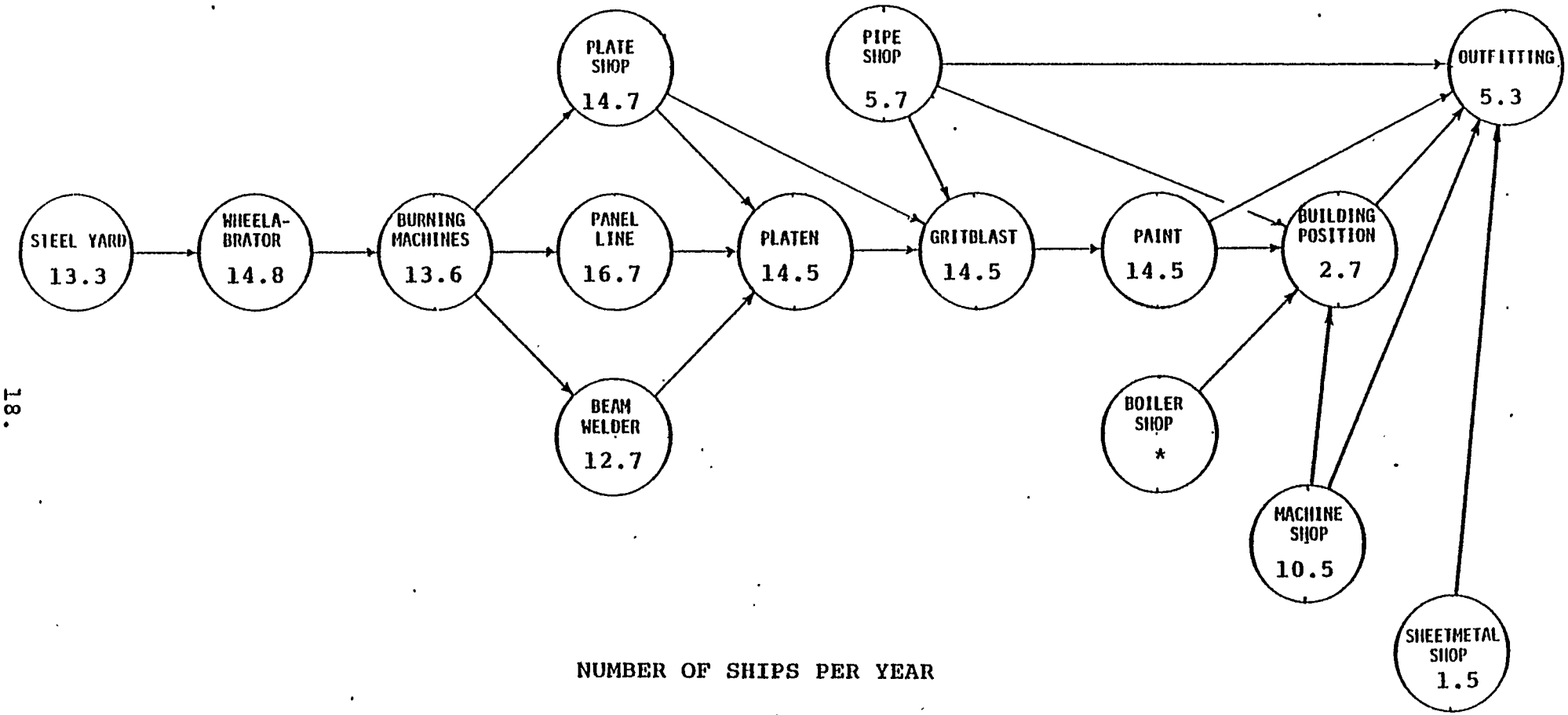


NUMBER OF SHIPS PER YEAR



NUMBER OF SHIPS PER YEAR

T - A R C



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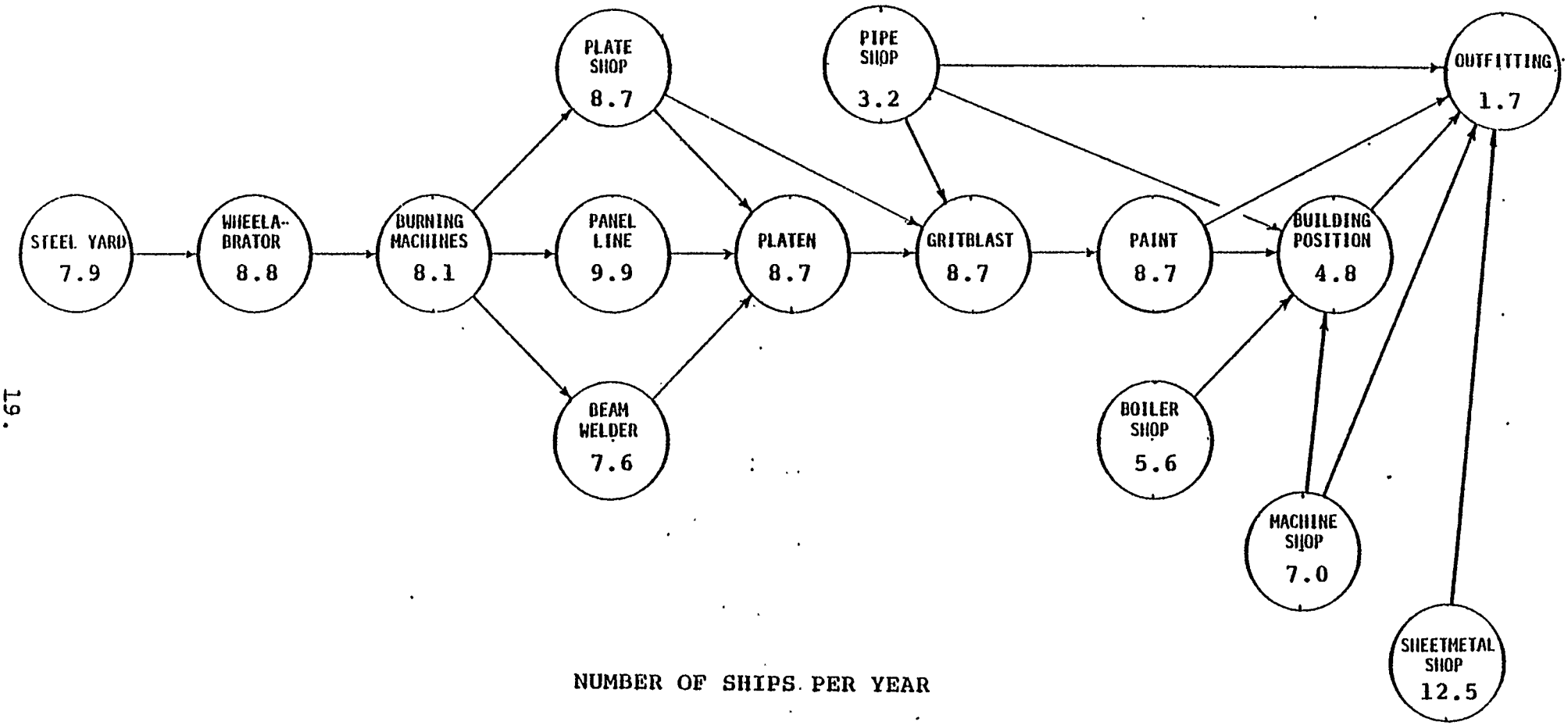

NUMBER OF SHIPS PER YEAR

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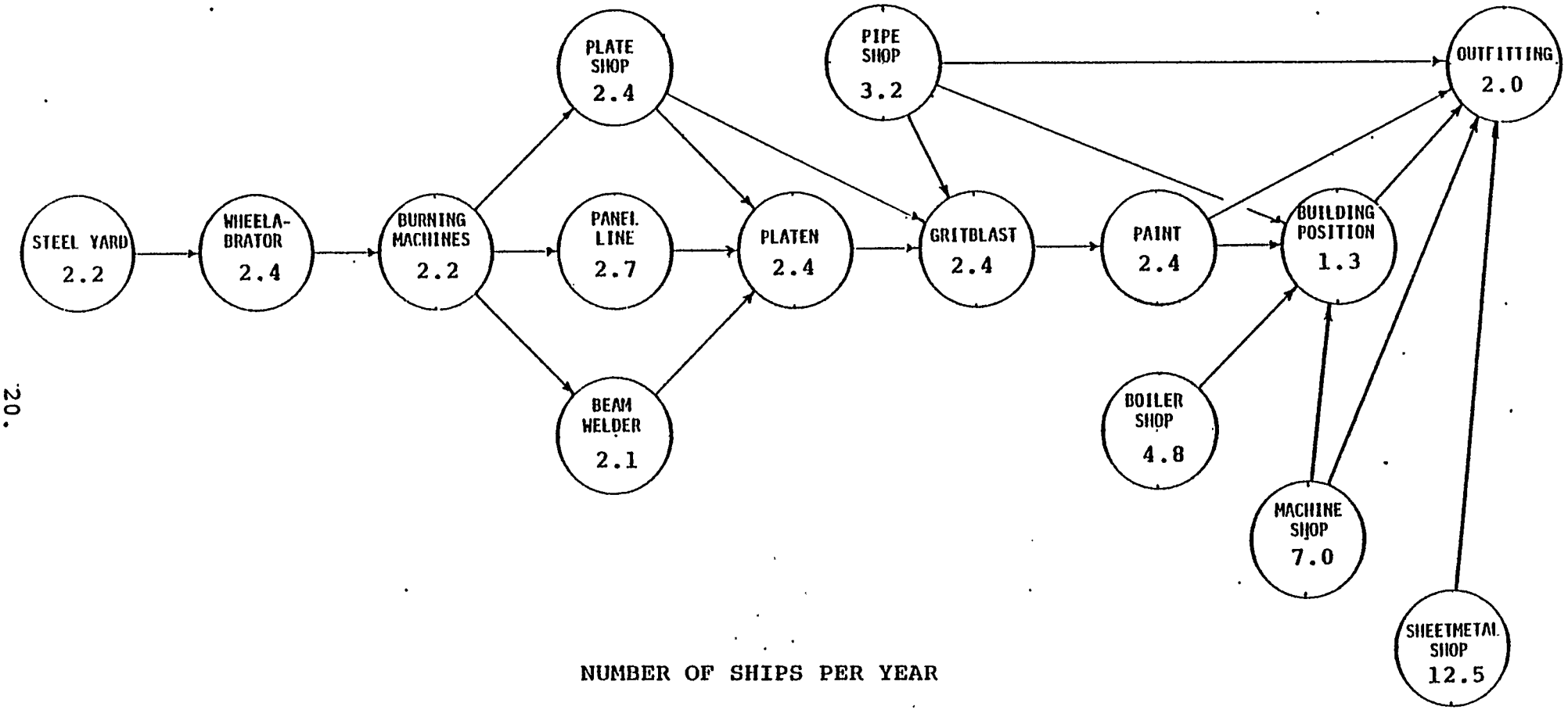
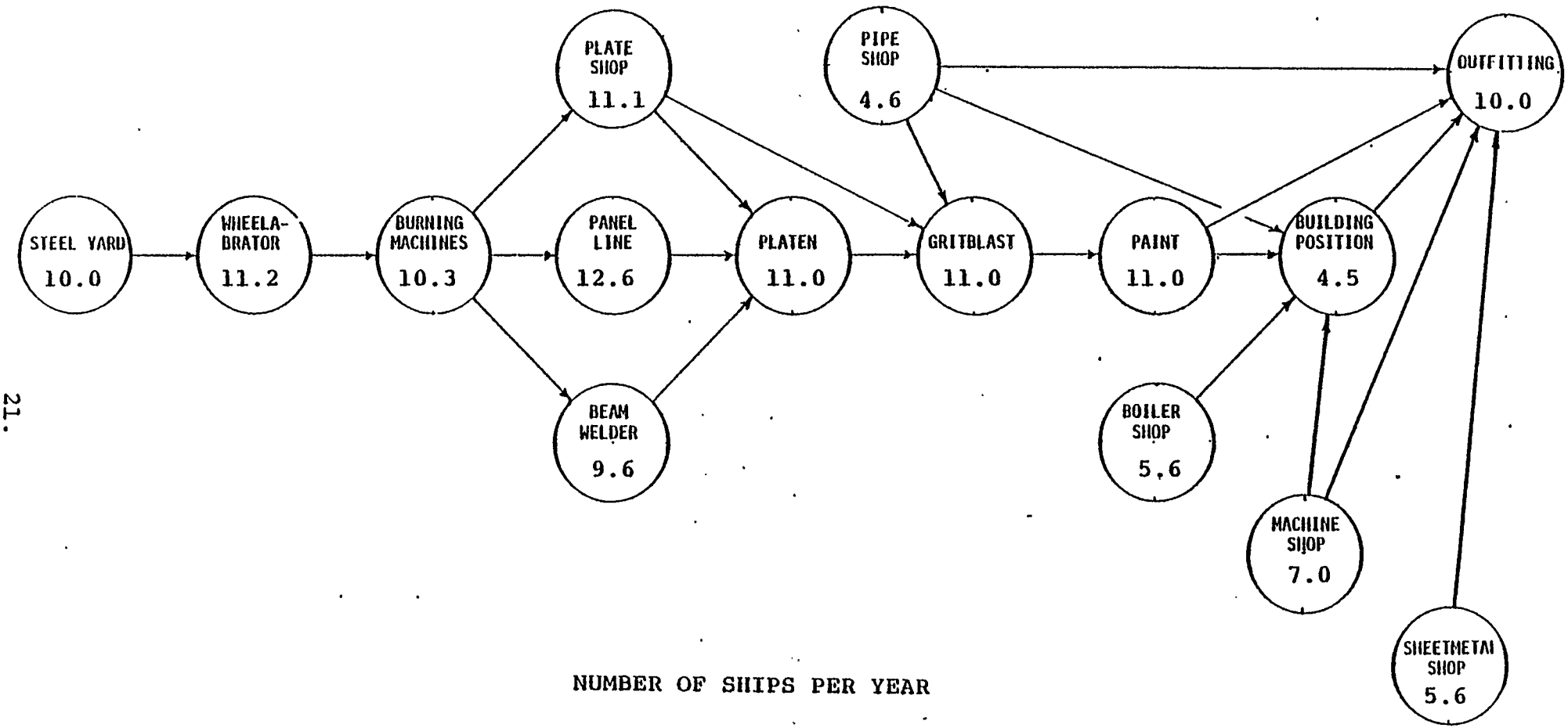
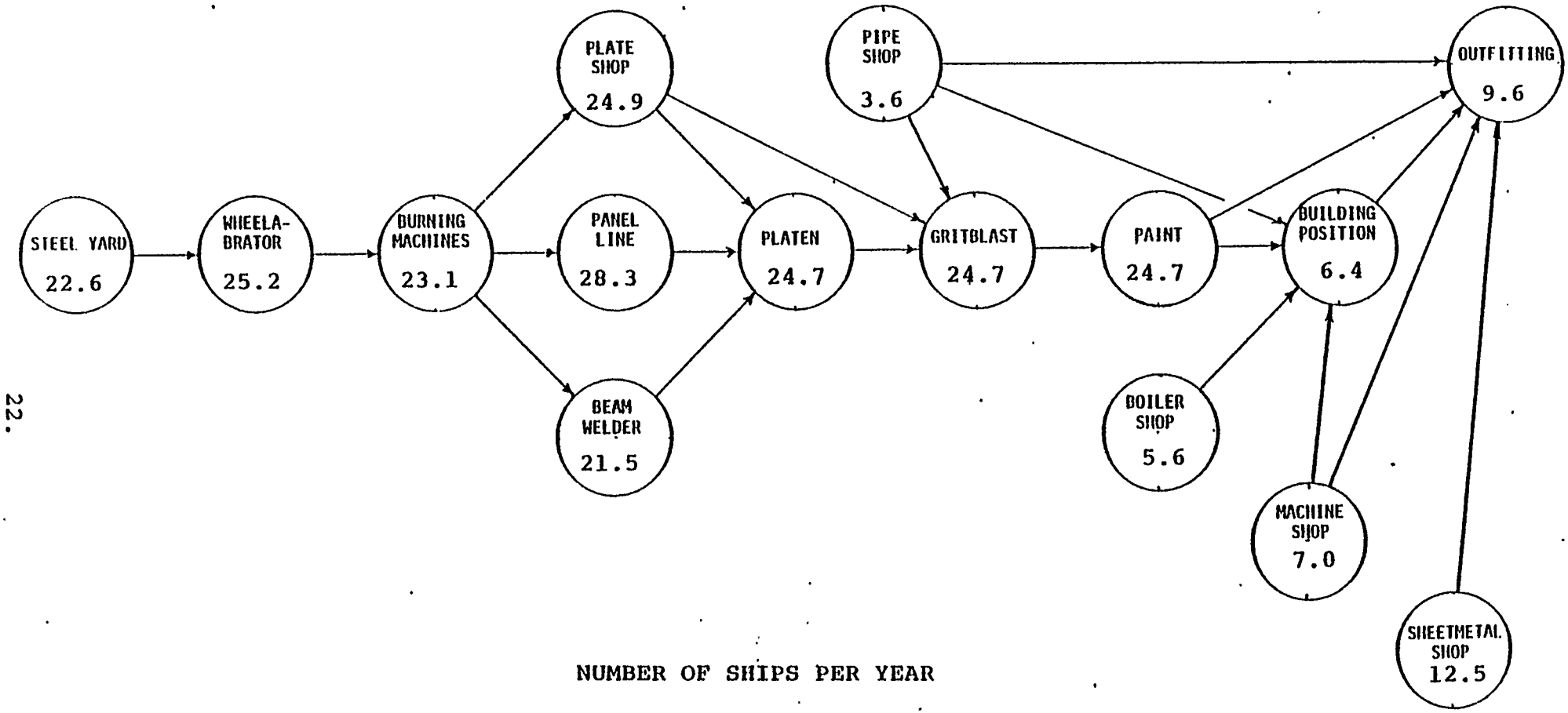


NUMBER OF SHIPS PER YEAR

C P C

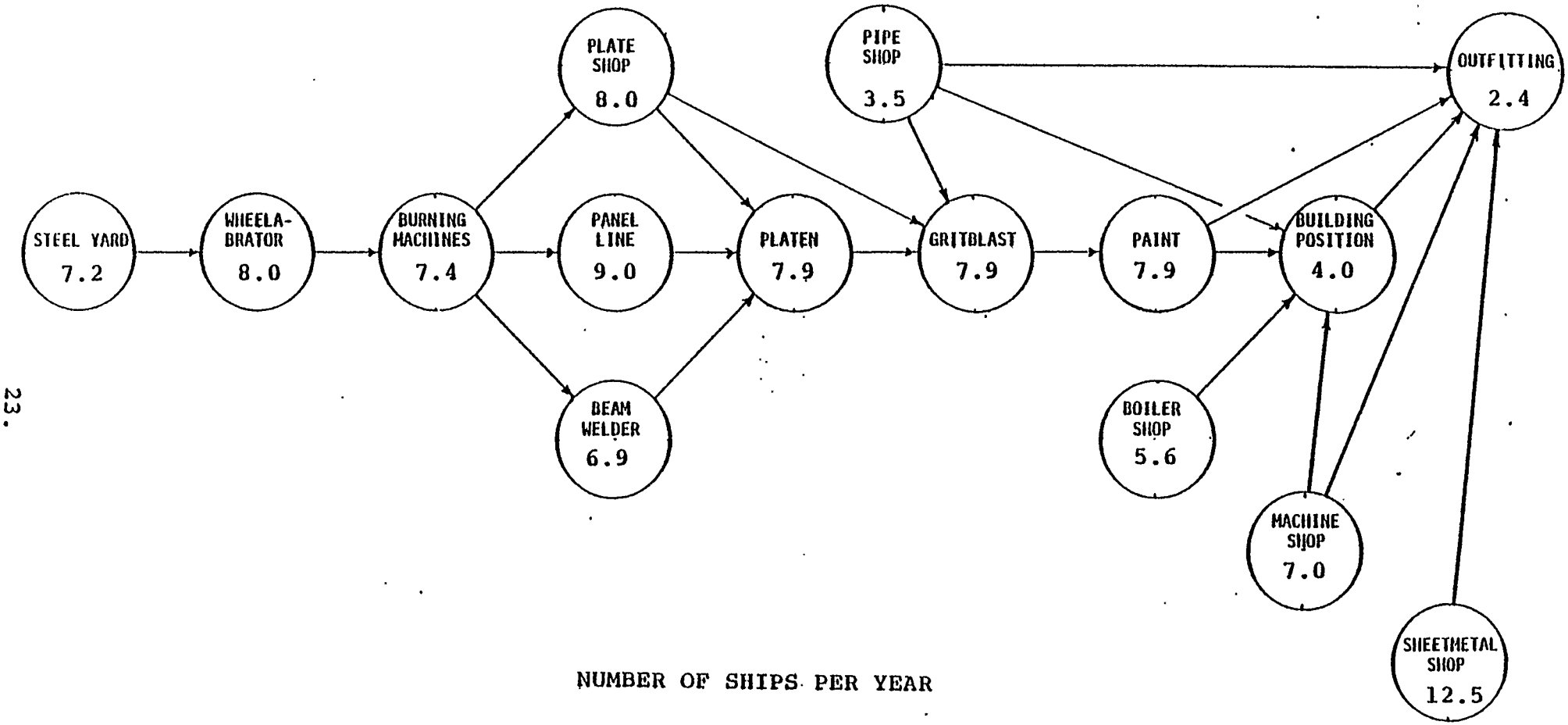


NUMBER OF SHIPS PER YEAR



NUMBER OF SHIPS PER YEAR

OBO



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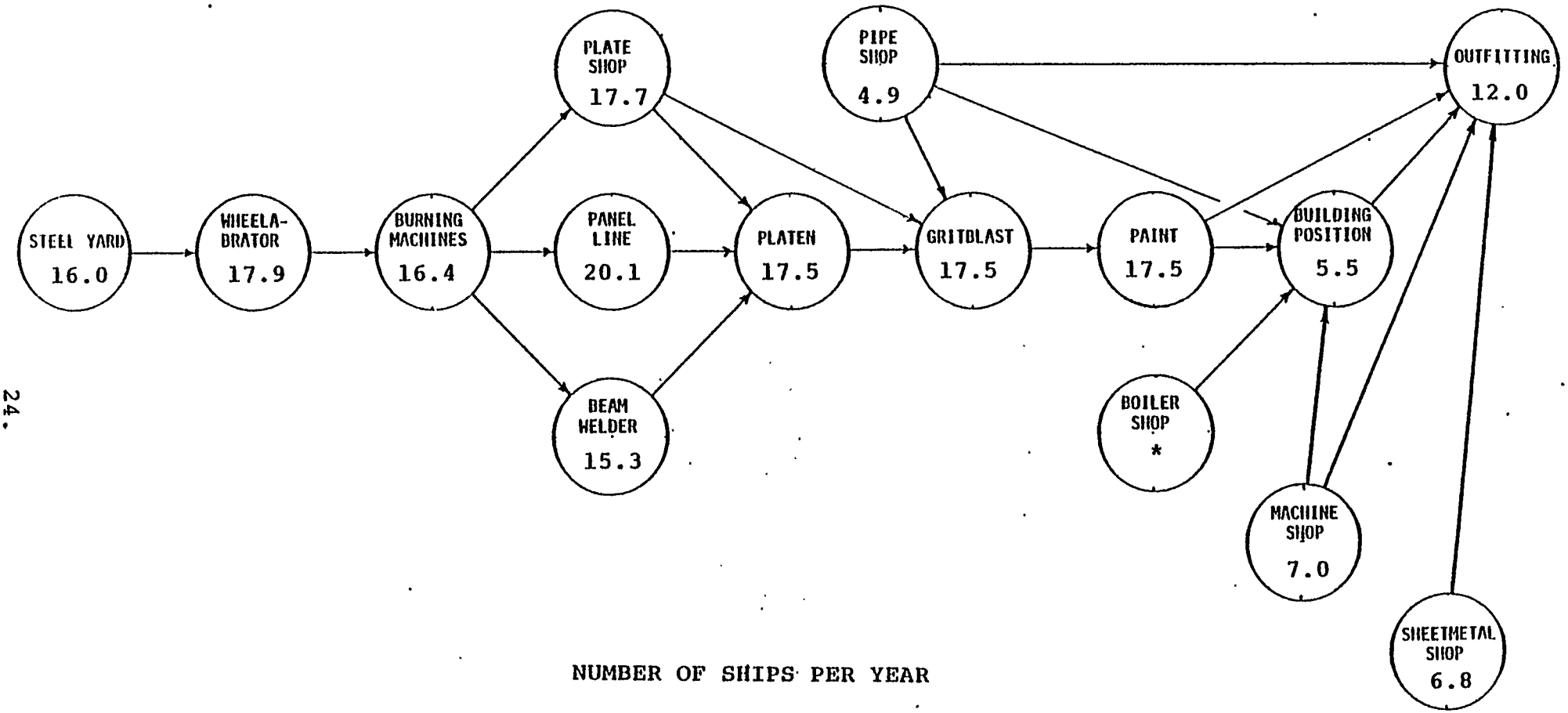

NUMBER OF SHIPS PER YEAR

* Diesel powered vessel, boilers not required.

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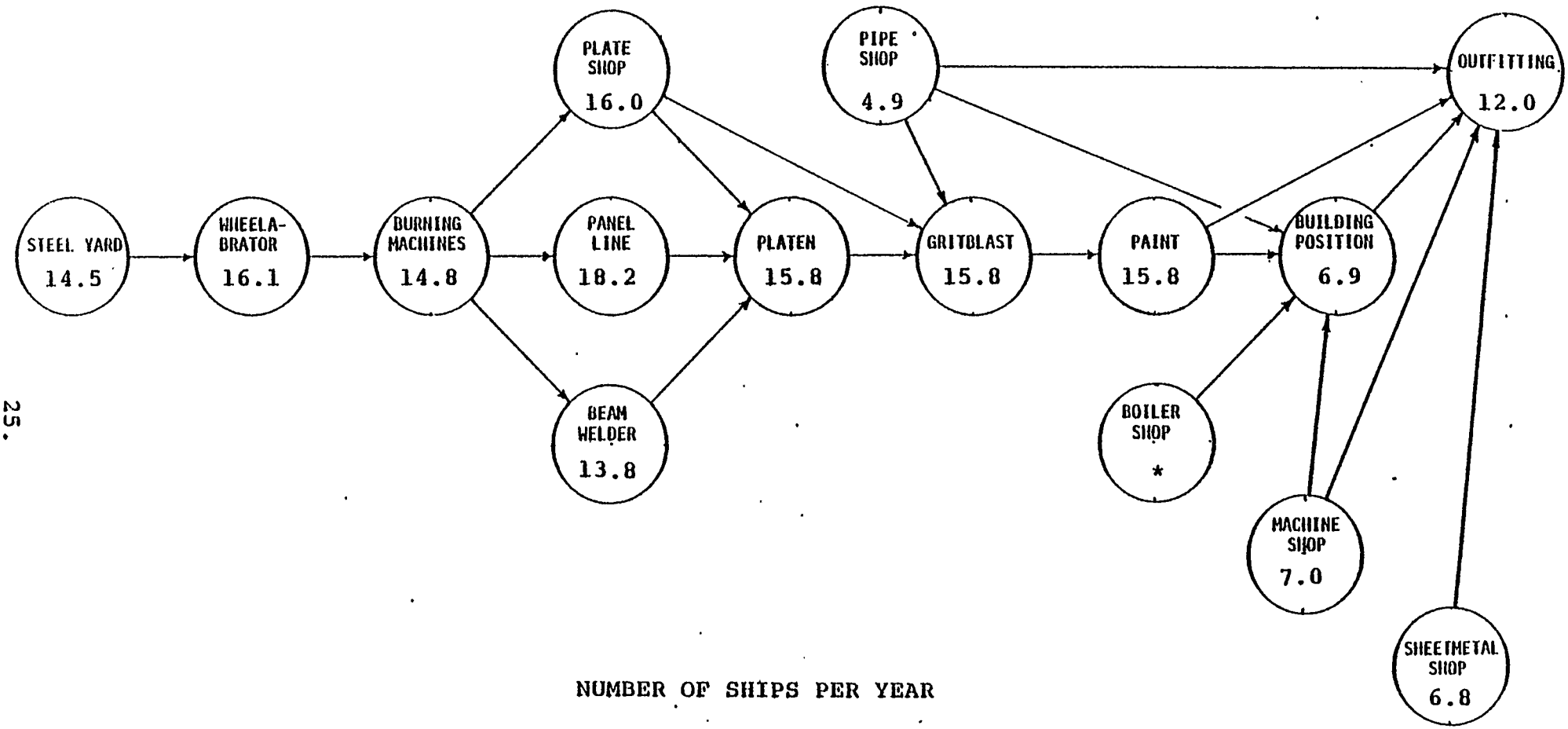

NUMBER OF SHIPS PER YEAR

* Diesel powered vessel, boilers not required.

IV. FACILITIES/CAPACITY DATA

NEW CONSTRUCTION CAPACITY MATRIX*

Major Facility	Capacity Indicator	NASSCO Built Vessels Since 1970											
		LST	AFS	AOR	AD	T-ARC	SCT	SDT	CPC	CT	OBO	LPC	IPC
Outfitting Berths	Varies	5.5	6.0	2.2	2.6	5.3	1.7	2.0	10.0	9.6	2.4	12.0	12.0
Building Positions	Varies	4.8	4.4	3.3	2.0	2.7	4.8	1.3	4.5	6.4	4.0	5.5	6.9
Paint	2350 Tons/Week	27.8	25.3	6.2	3.7	14.5	8.7	2.4	11.0	24.7	7.9	15.8	17.5
Grit Blast	2350 Tons/Week	27.8	25.3	6.2	3.7	14.5	8.7	2.4	11.0	24.7	7.9	15.8	17.5
Platen	2350 Tons/Week	27.8	25.3	6.2	3.7	14.5	8.7	2.4	11.0	24.7	7.9	15.8	17.5
Panel Line	2700 Tons/Week	31.9	29.0	7.2	4.2	16.7	9.9	2.7	12.6	28.3	9.0	18.2	20.1
Plate Shop	2375 Tons/Week	28.1	25.5	6.3	3.7	14.7	8.7	2.4	11.1	24.9	8.0	16.0	17.7
Burning Machines	2200 Tons/Week	26.0	23.6	5.8	3.5	13.6	8.1	2.2	10.3	23.1	7.4	14.8	16.4
Beam Welder	2050 Tons/Week	24.2	22.0	5.4	3.2	12.7	7.6	2.1	9.6	21.5	6.9	13.8	15.3
Wheelabrator	2400 Tons/Week	28.4	25.8	6.4	3.8	14.8	8.8	2.4	11.2	25.2	8.0	16.1	17.9
Steel Yard	2150 Tons/Week	25.4	23.1	5.7	3.4	13.3	7.9	2.2	10.0	22.6	7.2	14.5	16.0
Boiler Shop	Varies	Diesel	5.6	3.7	5.6	Diesel	5.6	4.8	5.6	5.6	5.6	Diesel	Diesel
Machine Shop	Varies	10.5	21.0	10.5	21.0	10.5	7.0	7.0	7.0	7.0	7.0	7.0	7.0
Sheet Metal Shop	10 Pkg./Week	N/A	N/A	1.0	.5	1.5	12.5	12.5	5.6	12.5	12.5	6.8	6.8
Pipe Shop	8560 Lin.Ft./Week	3.6	3.4	2.3	1.6	5.7	3.2	3.1	4.6	3.6	3.5	4.9	4.9

FACILITY/CAPACITY DATA SHEET

OUTFITTING BERTHS

DESCRIPTION

The primary mission of Outfitting is the completion of a ship after launch or flotation. Typically includes the installation of the many small standard components used in a ship, especially those associated with living facilities.

PRESENT CAPACITY

Outfitting capacity is limited by the number of berths equipped to handle outfitting. NASSCO has ten berthing positions of which six are used for outfitting. Only one (Berth 2) of the six berths can handle all the functions for any types of vessel to make it ready for delivery. The other berths (1, 3, 4, 5 & 6) which are used for outfitting are restricted in use either by depth or length. The remaining berths (7, 8, 9 & 10) for one reason or another are not considered suitable for outfitting. Berths 7 & 8 have limited access and no whirley crane service, therefore are only suitable for berthing barges or tugs. Berths 9 & 10 are considered to be Repair Work berths, however they could be used as backup outfitting positions if needed.

SHIP TYPE	MONTHS IN OUTFITTING (1)	POSSIBLE BERTHS FOR OUTFITTNG (2)	CAPACITY SHIPS PER YEAR (3)
LST	11.0	1, 2, 3, 4, 6	5.5
AFS	10.0	1, 2, 3, 4, 6	6.0
AOR	22.0	1, 2, 4, 6	2.2
AD	14.0	2, 4, 6	2.6
T-ARC	13.5	1, 2, 3, 4, 5,.6	5.3
SCT	7.0	2	1.7
SDT	6.0	2	2.0
OCPC	6.0	1, 2, 4, 5, 6	10.0
CT	5.0	1, 2, 4, 6	9.6
OBO .	5.0	2	2.4
LPC	S.o	1, 2, 4, 5, 6	B12.0
IPC	5.0	1, 2, 4, 5, B6	B12.0

CAPACITY IMPROVEMENT

Additional capacity can be achieved by double berthing at Berth Two, dredging Berths 4, 5 & 6,' use Berths 9 & 10 for final stages of outfitting, use off-site berthing, or increase pre-election outfitting activities.

BERTHING POSITION DATA

BERTE NUMBER	MAXIMUM SHIP LENGTH (FT.)	DEPTH M.L.L.W. (FT)
1	620	23-27
2	910	28-32
3	560	28-30
4	625	28-30
5	1,040	23-29,
6	1,090	23-29
7	350	19-22
8	300	19-19
9	825	22-22
10	775	22-22

(1) Developed from A. J. Nadeau's report HISTORY KEY DATES (Ref. A.).

(2) Developed from J. Tucker's IDM SHIP DELIVERY SCHEDULE 12/29/79 (Ref. B.).

(3) (12 Mo. X NO. possible outfitting berths) - months in Outfitting = Capacity.

FACILITY/CAPACITY DATA SHEET

BUILDING POSITIONS

DESCRIPTION

The primary mission of the Building Positions (erection) is the process of assembling all of the erectable units into a complete hull. Erection, strictly speaking, is the process of hoisting and fitting the units in place. Common usage also includes the final welding.

PRESENT CAPACITY

Erection capacity is limited-by the four-Building Positions ' consisting of one Building Basin and three inclined end launch ways. The maximum size vessel which can be erected is 980 feet long, with a breadth of 170 feet and weight of 33,000 tons. All Building Positions are serviced on both sides by whirley cranes ranging in lift capacity from 45 to 175 tons.

SHIP TYPE	MONTHS IN[1] BUILDING POSITION	POSSIBLE POSITIONS "[2], .." FOR BUILDING .	CAPACITY[3] SHIPS PER YEAR
LST	10.0	1, 2, 3, 4	4.8
AFS	11.0	1, 2, 3, 4	4.4
AOR	11.0	1, 3, 4	3.3
AD	18.0	2, 3, 4	2.0
T-ARC	13.5	2, 3, 4	2.7
SCT	7.5	1, 3, 4	4.8
SDT	9.5	1	1.3
CPC	8.0	1, 3, 4	4.5
CT	7.5	1, 2, 3, 4	6.4
OBO	9.0	1, 3, 4	4.0
LPc	6.5	1, 3, 4	5.5
IPc	7.0	1, 2, 3, 4	6.9

CAPACITY IMPROVEMENT

To increase Building Position throughput the work must be shifted from the Building Position to the yard. This can be accomplished in a number of ways, such as erecting larger units, use of modular construction, and pre-erectian outfitting techniques.

BUILDING POSITION DATA

BUILDING POSITION NUMBER	TYPE BUILDING POSITION	MAXIMUM SHIT LENGTH (FT.)	MAXIMUM BEAM (FT.)	MAXIMUM LAUNCH WEIGHT (TONS)	MAX&MOM DWT
1	Basin	980	170	33,000	200,000
2	Inclined Ways	690'	90	12,000	40,000
3	Inclined Ways	900	106	16,800	90,000
4	Inclined Ways	900	106	16,800	90,000

(1) Developed from A. J. Nadeau's report HISTORY KEY DATES (Ref. A.).

(2) Developed from J. Tucker's IDM SHIP DELIVERY SCHEDULE 12/29/79 (Ref. B.).

(3) (12 Mo. x No. possible building positions) ÷ months in building positions = Capacity.

FACILITY/CAPACITY DATA SHEET

PRE-ERECTION PAINT -

DESCRIPTION

The *mission of the* Pre-erection Paint Area is the priming of erectable units. This operation typically occurs just after TH'de unit has been grit blasted to bare metal. The primer protects the metal until the finish coats are applied either in the Building Position or in Outfitting.

PRESENT CAPACITY

Pre-erection Painting is presently being performed under a blue-sky set-up, located in the east end of the yard. The throughput of this area has been established at 2,350 tons of steel per week [1] on a continuous basis. This is based on NASSCO'S typical two shift operational mode, using approximately 50,000 sq. ft. of yard space.

SHIP TYPE	SHIP[2] STEEL WEIGHT (TONS)	PAINT AREA CAPACITY TONS/WEEK	EQUIVALENT[3] S a n RATIO	CAPACITY[4] SHIPS PER YEAR
LST	6,607	2,350	.64	27.8
AFs	5,170	2,350	.90	25.3
AOR	8,661	2,350	2.18	6.2
AD	8,046	2,350	3.96	3.7
T-ARC	5,400	2,350	1.50	14.5
SCT	13,573	2,350	1.00	8.7
SDT	28,524	2,350	1.75	2.4
CPC	8,858	2,350	1.21	11.0
CT	6,619	2,350	.72	24.7
OBO	15,540	2,350	.96	7.9
LPC	9,291	2,350	.80	1.5.8
IPc	8,182	2,350	.82	17.5

CAPACITY IMPROVEMENT

Capacity can be increased rather easily just by allocating additional blue-sky space and the purchase of painting equipment (gUnS and paint pOSts) This area should never be a bottleneck to yard throughput.

(1) Taken from CAPACITY DEVELOPMENT MATRIX.

(2) Derived from STATUS OF STEEL REPORT.

(3) Taken from EQUIVALENT SHIP RATIO'S (Ref. C.) (Also could be called a difficulty or complexity factor).

(4) (50 Wks x 2350 Tons/Wk.) ÷ (Ship steel x equiv. ship ratio) = Capacity.

FACILITY/CAPACITY DATA SHEET

GRIT BLAST AREA

DESCRIPTION

The Grit Blast facility primary mission is the removal of rust and scale from erectable units in preparation for primer and paint. Grit blasting is performed under a blue-sky set-up located in the east end of the yard.

PRESENT CAPACITY

The throughput of the Grit Blast area has been established at 2,350 tons of steel per week '([1]) on a 'continuous basis. The capacity is based on a two shift operation, approxi bately 100,000 sq. ft. of space and current use of a 32 nozzle set-up.

SHIP TYPE	SHIP (2) STEEL WEIGHT (TONS)	PAINT AREA CAPACITY TONS/WEEK	EQUIVALENT SHIP RATIO	CAPACITY[4] SHIPS PER YEAR
LST	. 6,607	2,350	.64	27.8
AFS	5,170	2,350	●90	25.3
AOR	8,661	2,350	'2.18	6 . 2
AD	8,046	2,350	3.96	3.7
T-ARC	5,400	2,350	1.50	14.5
SCT	13,573	2,350	1.00	8.7
SDT	28,524	2,350	1.75	*2.4*
CFC	8,858	2,350	1.21	11.0
CT	6,619	2,350	.72	24.7
OBO	1.5,540	2,350	.96	7.9
LPC	9,291	2,350	80	15.8
IPc	8,182	2,350	.82	17.5

CAPACITY IMPROVEMENT

Capacity can be increased by allocating additional blue-sky space and the addition of blast units. If a short term increase in capacity was required, portable blast pots could be used on a temporary basis.

(1) Taken from CAPACITY DEVELOPMENT MATRIX.
(2) Derived from STATUS OF STEEL REPORT.
(3) Taken from EQUIVALENT SHIP RATIO'S (Ref. C.).
(4) (50 Wks x 2350 Tons/Wk.) ÷ (Ship steel x equiv. ship ratio) = Capacity.

FACILITY/CAPACITY DATA SHEET

PLATENS

DESCRIPTION

The primary mission of the Platens is the process of assembling two or more plates and/or sub-assmblies to form an erectable unit. The operations performed on the platens include burning, layout, fitting and welding.

PRESENT CAPACITY

The throughput of the Platens (1-9) has been established at 2,350 tons of steel per week (1) on a continuous basis. The capacity is based on a two shift operation, with 114,706 sq. ft. of Platens for flat units, and 23,672 sq. ft. of Platen for curved units.

SHIP TYPE	SHIP (2) WEIGHT~FONS)	PLATEN "CAPACITY TONS/WEEK	EQUIVALENT (3) 'SHIP' RATIO	CAPACITY (4) SHIPs PER YEAR
LST	6,607	2,350	.64.	27.8
AFS	5,170	2,350	.90	25.3
AOR	8,661	2,350	2.18	6.2
AD	8,046	2,350	3.96	3.7
T-ARC	5,400	2,350	1.50.	14.5
SCT	13,573	2,350	1.00	8.7
SDT	28,524	2,350	1.75	2.4
CPC	8,858	2,350	1.21	11.0
CT	6,619	2,350	.72	24.7
OBO	15,540	2,350	.96	7.9
LPC	9,291	2,350	.80	1.5.8
IPC	8,182	2,350	.82	17.5

CAPACITY IMPROVEMENT

Additional Platen capacity can be achieved by adding additional Platen area, up-grade existing Panel Line to include Stiffener Station and add bridge crane service for Platens 5, 6 and 7.

PLATEN DATA

PLATEN No.	TYPE	SIZE (FT.)	AREA (SQ. FT.)
1	Flat	55 x 790	43,450
2	Curved	44 x 538	23,672
3	Flat	43 x 155	6,077
4	Flat	58 x 171	9,918
5	Flat	43 x 354	15,222
6	Flat	43 x 354	15,222
7	Flat	60 X 104	6,240
8	Flat	58 x 109	6,320
9	Flat	57 x 215	12,255
		TOTAL AREA	138,378

(1) Taken from CAPACITY DEVELOPMENT MATRIX.

(2) Derived from STATUS OF STEEL REPORT.

(3) Taken from EQUIVALENT SHIP RATIO'S (Ref. C.).

(4) (50 Wks x 2350 Tons/Wk.) ÷ (Ship steel x equiv. ship ratio) = Capacity.

FACILITY/CAPACITY DATA SHEET

PANEL LINE

DESCRIPTION

The primary mission of the Panel Line is the fabrication of panel assemblies. The process includes the fitting of two or more plates together and the welding of the seam to form a panel.

PRESENT CAPACITY

The throughput of the Panel Line has been established at 2,700 tons of. steel per week [1] on a continuous basis.. The capacity is based on a two shift operation utilizing a team of four welders, one fitter and one chipper on each shift.

SHIP TYPE	SHIP[2] STEEL WEIGHT (TONS)	PANEL LINE CAPACITY TONS /WEEK	EQUIVALENT[3] SHIP RATIO	CAPACITY[4] SHIPS PER YEAR
LST	6,607	2;700	.64	31.9
AFS	5,170	2,300	..90	29.0
AOR	8,661	2,700	2.18	7.2
AD	8,046	2,700	3.96	4.2
T-ARC	5,400	2,700	1.50	16.7
SCT	13,573	2,700	1.00	9.9
SDT	28,524	2,700	1.75	2.7
CPc	8,858	2,700	1.21	12.6
CT	6,619	2,700	.72	28.3
OBO	15,540	2,700	.96	9.0
LPC	9,291	2,700	,80	18.2
IPC	8,182	2,700	.82	20.1

CAPACITY IMPROVEMENT

Additional Panel Line capacity can be achieved by providing a dedicated crane for turning the panels over and removal of finished panels. This would reduce, if not eliminate, the current delays experienced due to poor crane service.

PANEL LINE DATA

Type of Assemblies

. Flat Panels

Limitations

- Plates
  - Length :. 40′ Max.
  - Width: 10′ Max.
  - Thickness: 1-1/4″ Max.
- o Panel
  - Length :, 65′ MAX.
  - Width:. 40′ MaX.
  - Weight: 66 Tons Max.

(1) Taken from CAPACITY DEVELOPMENT MANAGER.

(2) Derived from STATUS OF STEEL REPORT.

(3) Taken from EQUIVALENT SHIP RATIO'S (Ref. C.).

(4) (50 Wks x 2700 Tons/Wk.) + (Ship steel x equiv. ship ratio) = Capacity.

FACILITY/CAPACITY DATA SHEET

PLATE SHOP

DESCRIPTION

The primary function of the Plate Shop is the fabrication of single parts from raw material such as plate or shape stock. The material is cut, punched, bent, fitted or welded to produce the required parts.

PRESENT CAPACITY

The throughput of this shop is limited by fabrication space and the high utilization of some important equipment (Plate Shear and 1,000 ton Brake Press) . The maximum output for the Plate Shop has been established at 2,375 tons steel per week (1) on a continuous basis. The capacity is based on a two shift operation, utilizing 90,000 sq. ft. of shop area (includes Platen 10).

SHIP TYPE	SHIP (2) STEEL WEIGHT (TONS)	PLAE SHOP " CAPACITY . TONS /WEEK	EQUIVALENT (3) SHIP RATIO	CAPACITY (4) SHIPS PER YEAR
LST	6,607	2,375	.64	28.1
AM	5,170	2,375	.90	25.5
AOR	8,661	2,375	2.18	6.3
AD	8,046	2,375	3.96	3.7
T-ARC	5,400	2,375	1.50	14.7
SCT	13,573	2,375	1.00	8.7
SDT	28,524	2,375	1.75	2.4
CPC	8,858	2,375	1.21	11.1
CT	6,619	2,375	.72	24.9
OBO	15,540	2,375	.96	8..0
LPC	9,291	2,375	.80	16.0
IPc	8,182	2,375	.82	17.7

CAPACITY IMPROVEMENT

Additional Plate Shop capacity ,can be achieved by providing additional fabrication area and additional equipment such as a Plate Shear, 1,000 ton Brake Press, and C-Press.

Taken from CAPACITY DEVELOPMENT MATRIX.

'(2) Derived from STATUS OF STEEL REPORT.

'(3) Taken from EQUIVALENT SEIP RATIO'S (Ref. C.).

'(4) (50 Wks x 2375 Tons/Wk.) + (Ship steel x equiv. ship ratio) = CaPacity.

FACILITY/CAPACITY DATA SHEET

STATIONARY BURNING' MACHINES

DESCRIPTION

The current steel plate cutting requirements are handled by eight stationary Burning Machines. Each machine has an intended function in the production cycle. For example, the Flame Planer is used to cut webs and flanges for the 'T' Beam Welder and the CM-56 Shape Cutter is used to cut fitting aids.

PRESENT CAPACITY

The stationary Burning Machines as a whole can support a cutting capacity of 2,200 tons steel Per week (1) on a continuous basis. This throughput is based on a two shift operation utilizing all eight machines.

SHIP TYPE	SHIP(2) STEEL WEIGHT (TONS)	BURNING MA-S CAPACITY TONS/WEEK	EQUIVALENT(3) SHIP RATIO	CAPACITY (4) SHIPS PER YEAR
LST	6,607	2,200	.64	26.0
AFS	5,170	2,200	.90	23.6
AOR	8,661	2,200	2.18	5.8
AD	8,046	2,200	3.96	3.5
T-ARC	5,400	2,200	1.50	13.6
SCT	13,573	2,200	1.00	8.1
SDT	28,524	2,200	1.75	2.2
CPC	8,858	2,200	1.21	10.3
CT	6,619	2,200	.72	23.1
OBO	15,540	2,200	.96	7.4
LPC	9,291	2,200	.80	14.8
IPC	8,182	2,200	.82	16.4

CAPACITY IMPROVEMENT

Additional cutting capacity can be achieved by converting existing natural gas cutting torches to plasma torches, which have a much higher cutting speed. An additional stationary Burning Machine can always be added to increase capacity.

BURNING MACHINE DATA

MACHINE	TYPE CUTS	TYPE TORCH	MAXIMUM PLATE SIZE (FT.)	NO. TABLES USED SIMO
CM-56 Shape Cutter	Shape & Longitudinal	Natural *Gas*	10 X 42	1
CM-60-1 Shape Cutter	Shape & Longitudinal	Natural Gas	10 x 40	1
CM-60-2 Shape Cutter	Shape & Longitudinal	Natural Gas	10 x 40	1
CM-70 Shape Cutter	Shape & Longitudinal	Natural Gas	10 X 42	2
CM-100 Flame Planer	Longitudinal	Natural Gas	10 X 42	2
CM-150 Shape Cutter	Shape & Longitudinal.	Plasma	10X40	2
CM-160 Shape Cutter	shape & Longitudinal	Natural Gas	10 x 42	2
Flame Planer	Longitudinal	Natural Gas	10 x 42	1

(1) Taken from CAPACITY DEVELOPMENT MATRIX.

(2) Derived from STATUS OF STELL REPORT.

(3) Taken from EQUIVALENT SHIP RATIO'S (Ref. C.).

(4) (50 WKS X 2200 Tons/m.) / (Ship Steel x eqUIV. Ship ratio) = capacity.

FACILITY/CAPACITY DATA SHEET

'T' BEAM WELDER

DESCRIPTION

The primary mission of the 'T' Beam Welder is the fabrication of tee's and built-up angles for *use* as stiffeners and longitudinal in ship construction. The Beam Welder is a very versatile machine in that it can fabricate a wide variety of shapes from stripped plate stock to the specifically required flange and web strength required by the Design Engineering Group.

PRESENT CAPACITY

The throughput of the 'T' Beam Welder has been established *at* 2,050 tons steel per week[1] on a continuous.

SHIP TYPE	SHIP[2] STEEL WEIGHT (TONS)	BEAM WELDER CAPACITY TONS/WEEK	EQUIVALENT[3] SHIP RATIO	CAPACITY[4] SHIPS PER YEAR
LST	6,607	2,050	.64	24.2
AFS	5,170	2,050	.90	22.0
AOR	8,661	2,050	2.18	5.4
AD	8,046	2,050	3.96	3.2
T-ARC	5,400	2,050	1.50	12.7
SCT	13,573	2,050	1.00	7.6
SDT	28,524	2,050	1.75	2.1
CPC	8,858	2,050	1.21	9.6
CT	6,619	2,050	.72	21.5
OBO	15,540	2,050	.96	6.9
LPC	9,291	2,050	.80	13.8
IPC	8,182	2,050	.82	15.3

CAPACITY IMPROVEMENT

The maximum capacity of 2,050 tons per week can be doubled by adding one additional Flame Planer to support the Beam Welder.

'T' BEAM WELDER DATA

. Limitations

Maximum Beam Length 42'
Maximum Web Width 30"

(1) Taken from CAPACITY DEVELOPMENT MATRIX.

(2) Derived from STATUS OF STEEL REPORT.

(3) Taken from. EQUIVALENT SHIP RATIO'S (Ref. C.).

(4) (50 WKS x 2050 Tons/Wk.) / (Ship steel x equiv. ship ratio) = Capacity.

FACILITY/CAPACITY DATA HEET

WHEELABRATOR

DESCRIPTION

The Wheelabrator is an integral part of the material handling system feeding steel plate from the steel yard to production area via the collocator system. The primary mission of the Wheelabrator is to remove mill scale from steel plates and shapes. The Wheelabrator facility is also equipped to apply primer to the blasted material. However, this unit is not currently used as it is not part of NASSCO'S method' of fabrication.

PRESENT CAPACITY

The throughput of the Wheelabrator has been established at 2,400 tons steel per week[1] on a continuous two shift basis.

SHIP TYPE	SHIP[2] STEEL WEIGHT (TONS)	WHEELABRATOR CAPACITY TONS /WEEK	EQJIVALENT[3] SHIP RATIO	CAPACITY[4] SHIPS PER YEAR
LST	6,607	2,400	.64	28.4
AFS	5,170	2,400	.90	25.8
AOR	8,661	2,400	2.18	6.4
AD	8,046	2,400	3.96	3.8
T-ARC	5,400	2,400	1.50	14.8
SCT	13,573	2,400	1.00	8.8
SDT	28,524	2,400	1.75	2.4
CPC	8,858	2,400	1.21	11.2
CT	6,619	2,400	.72	25.2
OBO	15,540	2,400	.96	8.0
LPC	9,291	2,400	.80	16.1
IPC	8,182	2,400	.82	17.9

CAPACITY IMPROVEMENT

Additional Wheelabrator capacity can be achieved by installing a shapes wheelabrator, thereby increasing both the throughput of shapes and plates.

WHEELABRATOR DATA

- Average traverse rate through Wheelabrator is ten lineal feet per minute.
- Maximum plate width is ten feet.
- Paint booth has over and under spray capabilities.

(1) Taken from CApACITY DEVELPMENT MATRIX.
(2) Derived from STATUS OF STEEL REPORT.
(3) Taken from EQUIVALENT SHIP RATIO'S (Ref. C.).
(4) (50 wK X 2400 Tons/Wk.) / (SHIP steel x EQUIV ship ratio) = CHENNAI.

FACILITY/CAPACITY DATA SHEET

STEEL YARD (PLATE STORAGE)

DESCRIPTION

The primary mission of the Steel Yard is the storage of raw steel plate. The yard has 270 potential stack locations which can be stacked to a height of 12 feet. The yard is served by a 15 ton bridge crane which is used to unload incoming steel from rail cars, sort material, shuffle and move material out of storage to the wheelabrator conveyor.

PRESENT CAPACITY

The throughput of the Steel Yard has been established at 2,150 tons of steel per week[1] on a continuous two shift operation.

SHIP TYPE	sol') WEIGHT(TONS)	STEEL YARD CAPACITY TONS/WEEK	EQUIVALENT[3] SHIP RATIO	CAPACITY[4] SHIPS PER YEAR
LST	6.,607	2,150	.64	25.4
AFs	5,170	2,150	.90	23.1
AOR	8,661	2,150	2.18	5.7
AD	8,046	2,1.50	3.96	3.4
T-ARC	5,400	2,150	1.50	13.3
SCT	13,573	2,150	1.00	7.9
SDT	28,524	2,150	1.75	2.2
CPC	8,858	2,150	1.21	10.0
CT	6,619	2,150	.72	22.6
OBO	15,540	2,150	.96	7.2
LPc	9,291	2,150	.80	14.5
IPc	8;182	2,150	.82	16.0

CAPACITY IMPROVEMENT

Additional Steel Yard capacity can be achieved a number of ways as discussed in the Steel Yard Report (Ref. D.) . The most logical approach to increase throughput is to standardize the plate stock. This would increase the present capacity by 560 percent if ever required.

STEEL YARD DATA

- Footprint of Steel Yard - 182,000 sq. ft.
- 270 different stack locations.
- Material received from supplier by: rail car.
- Material move in yard by: 15 ton magnetic bridge crane.
- Material move from yard by: power roller conveyor.

(1) Taken from CAPACITY DEVELOPMENT MATRIX.
(2) Derived from STATUS OF STEEL REPORT.
(3) Taken from EQUIVALENT SEIP RATIO'S (Ref. C.).
(4) (50 WKs x 2150 Tons/wk.) / (Ship steel x equiv. ship ratio) = Capacity.

FACILITY/CAPACITY DATA SHEET

BOILER SHOP

DESCRIPTION

The primary mission of the Boiler Shop is the erection of boilers. These units are used for steam turbine propulsion on board NASSCO-built ships. Vessel propulsion, at present, is tending more toward slow speed diesels than steam and this will reduce Boiler Shop throughput requirements.

PRESENT CAPACITY

The throughput of the Boiler Shop cannot be set on any one key indicator. Each ship type has a unique propulsion setup and must be factored individually. The capacity is based on a two shift operation utilizing a permanent erection fixture with four work stations. The fixture will support the erection of two boiler sets at any one given time.

TYPE SHIP	BOILERS PER SET	FABRICATION P E R BOILER SET	cipacity(') SHIPS/year
LST	*	—	—
AFs	2	18	5.6
AOR	3	18	3.7
AD	2	18	5.6
T-ARC	*		—
SCT	2	18	5.6
SDT	2	21	4.8
CPc	2	18	5.6
CT	2	18	5.6
OBO	2	18	5.6
LPc	*	--	--
IPc	*	—	—

* Diesel Propulsion

(1) [(s o w s / No.Fab.Wks./Boiler Set) x 4 Work Stations] / No. of Boilers/Set = Capacity.

CAPACITY IMPROVEMENT

No capacity improvements are stiggested for this area.

FACILITY. /CAPACITY DATA SHEET

MACHINE SHOP

DESCRIPTION

The primary mission of the new construction portion of the Machine Shop is the machining of shafts. The shaft lathe is the critical piece of equipment that will indicate capacity limits-tions. There are also a few other pieces of equipment that could have a minor impact "on shop throughput. They are tie planer and vertical boring mills.

PRESENT CAPACITY

The throughput of the Machine Shop can be established by using the following ormula:

$$\frac{\text{Maximum Yearly Shaft Output}}{\text{No. Shafts / Adjustment Factor}} = \text{Capacity}$$

The capacity is based on a two shift operation utilizing the current LeBlond shaft lathe which has a 50-inch swing and is .35 feet between centers. Overhead crane" capacity can also limit the size of shafts.

SHIP TYPE	NUMBER OF sCRzWs	NUMBER OF SHAFTS	ADJUSTMENT[1] FACTOR	*M4XIMUM YEARLY* SHAFT OUTPUT	CAPACITY[2] SHIPS /YEAR
LST	2	6	3	21	10.5
AFs	1	3	3	21 .	21.0
AOR	2	6	3	21	10.5
AD	1	3	3	21	21.0
T-ARC	2	6	3	*21*	10.5
SCT	1	3	1	21	7.0
SDT	. 1	3	1	21	7.0
CPC	1	3	1	21	7.0
CT	1	3	1	21	7.0
OBO	1	3	1	21	7.0
LPC	1	3	1	21	7.0
IPc	*1*	3	*1*	21	7.0

CAPACITY IMPROVEMENT

Additional Machine Shop capacity can be achieved by adding an NC shaft lathe with a 60-inch swing and 45 feet between centers (so long as no crane capacity problems develop).

(1) Adjustment factor used to indicate the reduced time required for machining holIow shaft type of ships.

(2) Capacity calculated on mentioned formula.

FACILITY/CAPACITY DATA SHEET

SHEETMETAL SHOP

DESCRIPTION

The primary mission of the Sheetmetal Shop is the fabrication of duct work for shipboard ventilation. The processes include the layout, cutting, foming , assembly and welding of sheetmetal to fabricate ducting.

PRESENT CAPACITY

The throughput of the Sheetmetal Shop can be established by using the following formula:

$$\frac{\text{Maximum Packages}^{(1)} \text{ Per Week} \times 50 \text{ Weeks}}{\text{No. Packages Per Ship}} = \text{capacity}$$

The capacity is based on a two shift operation which was typical in August 1980.

	SHIP TYPE	NO. PACKAGES PER SHIP(2)	MAXIMUM WEEKLY PACKAGE OUTPUT	CAPACITY(3) SHIPS /YIMR
	LST	N/A(4)	10	N/A
	AFs	N/A(4)	10	N/A
	AOR	500	10	1.0
	AD	995	10	.5
	T-ARC	330	10	1.5
	SCT	40	10	12.5
	SDT	40	10	12.5
	CPC	90	10	5.6
	CT	40	10	12.5
#	OBO	40	1 0	12.5
	LPC	73	10	6.8
	IPc	73	10	6.8

CAPACITY IMPROVEMENT

No capacity improvements are suggested as this area is under considerable change at this time.

(1) Packages are V-2 & S-2 units that are fabricated in the Sheetmetal Shop.
(2) Data on packages per ship provided by Harry Sheake, Supv. Vent. Ping.
(3) Capacity calculated on mentioned formula.
(4) Information not available.

FACILITY/CAPACITY DATA SHEET

PIPE SHOP

DESCRIPTION

The primary *mission of the* Pipe Shop is to fabricate pipe spools for installation during various stages of vessel construction. The activities utilized to fabricate pipe spools are cutting, bending, cleaning, fitting and welding of ferrous and nonferrous piping.

PRESENT CAPACITY

The throughput of the Pipe Shop has been established at 8,560 lineal feet of pipe per week (1) on a continuous two shift operation.

SHIP TYPE	LINEAL (2) FEET PIPE PER SHIP	MAXIMUM WEEKLY LIN. FT. PIPE OUTPUT	CAPACITY (3) SHIPS/YEAR
LST	118,355	8,560	3.6
AFs	125,928	8,560	3.4
AOR	183,977	8,560	2.3
AD	264,266	8,560	1.6
T-ARC	74,555	8,560	5.7
SCT	135,073	8,560	3.2
SDT	136,466	8,560	3.1
CPC	92,424	8,560	4.6
CT	117,972	8,560	3.6
OBO	121 ,823	8,560	3.5
LPc	86,898	8,560	4.9
IPc	87,000	8,560	4.9

CAPACITY IMPROVEMENT

Additional Pipe Shop capacity can be achieved with a minimal investment. The material flow through the Pipe Shop, if corrected with a new layout, would provide a substantial gain in output.

(1) Taken from CAPACITY DEVELOPMENT MATRIX.

(2) Taken from W. Sullivan's RIM: PIPE FOOTAGES - PAST & CURRENT NASSCO CONTRACTS June 29, 1981, (Ref. E.).

(3) (Max. Wkly. Lin. Ft. Pipe Per Wk. x 50 Wks.) ÷ No. Lin. Ft. Pipe Per ship L= LCapacity.

.

V, CAPACITY DEVELOPMENT

CAPACITY DEVELOPMENT MATRIX

MAJOR FACILITIES	Facility Capacities[1]	PROJECTIONS			
		Capacity By Shop Supervision	Capacity By J. McQuaide	Capacity By P. & P. C.	Capacity By L. R. F. P.
Outfitting Berths	(2)	---	---	---	---
Building Positions	(2)	---	---	---	---
Paint	2350 Tons/Wk	2200	3000	2500	1700
Grit Blast	2350 Tons/Wk	2200	3000	2500	1700
Platen	2350 Tons/Wk	2300	3000	2500	1700
Panel Line	2700 Tons/Wk	2300	3000	2500	3000
Plate Shop	2375 Tons/Wk	2300	3000	2500	1700
Burning Machines	2200 Tons/Wk	1600	3000	2500	1700
Beam Welder	2050 Tons/Wk	2000	2200	2200	1700
Wheelabrator	2400 Tons/Wk	2000	3000	2500	2100
Steel Yard	2150 Tons/Wk	1600	3000	2500	1500
Boiler Shop	(2)	---	---	---	---
Machine Shop	(2)	---	---	---	---
Sheetmetal Shop	10 Pkg/Wk	21 Ships/Yr	---	10 Pkg/Wk	---
Pipe Shop	8560 Lin.Ft/Wk	8000	---	8000	9700

(1) The figures in this column have been established by averaging the four Capacity Projection columns.

(2) Refer to the appropriate Facility/Capacity Data Sheet Present Capacity Chart.

CAPACITY DEVELOPMENT MATRIX COLUMN DESCRIPTIONS

MAJOR FACILITIES

Those facilities which could have a major effect on yard throughput have been included in this column. Shops such as the Electric Shop, Foundry and Carpenter Shop have not been included in this list for such reasons as: a major portion of work is repair or overhaul related, non-marine oriented work, or only minimal shop facilities are required to support aboard ship work.

0 FACILITY CAPACITIES

The figures printed in this column have been established for projecting throughput capacity constraints. The data was generated by averaging the capacity projections as determined by four different sources. Due to the variations in capacity numbers, the projections for each facility have been averaged to provide a realistic capacity indicator. This indicator is only good as long as the same performance level in each shop is maintained. If the performance decreases, so will the output. However, if it is improved our capacity will also increase.' It should be noted that NASSCO has a tremendous amount of untapped capacity in this respect.

e CAPACITY PROJECTION BY SHOP SUPERVISION

The data in this colunn was derived from a suney that was conducted in late 1980. Each shop supervisor was asked to provide data on their area of influence. The main objective of 'Ae survey was to have each person estimate their maximum potential capacity and reasons for not being able to exceed those figures.

● CAPACITY PROJECTION BY J. J. McQUAIDE

Mr. McQuaide, former Vice President of NASSCO Yard Operations, and presently a consultant at NASSCO, provided the following insight on capacity. His projections are based on the fact we can-reduce and minimize production problems, and return to producing similar class of ships such as the Coronado and San Clemente

tankers . He also stated that to reach his projections NASSCO would have to keep the number of new ship designs introduced into production at one time to a minimum.

- CAPACITY PROJECTION BY PLANNING AND PRODUCTION CONTROL (P. & P.C.)

Mr. Arden Mann was appointed by Mr. K. K. Christensen to be the Planning and Production Control Department's input coordinator on "capacity projections. Arden provided and validated capacity figures from such sources as past studies, Planning and Production Control personnel and records, and personal experience.

- . CAPACITY PROJECTION BY NASSCO'S LONG. RANGE .FACILITY PLAN (L.R.F.P.

The LRFP capacity figures were developed using ratios derived from historical production records and facilities information dating back to 1968. This data along with present capacity studies taking into account present methods and performance levels, provides the foundation for the capacity indicators shown in this column.

VI, SHIP DATA

SHIP CHARACTERISTICS

SHIP CLASS	HULL			Steel Weight (Tons)	Steel Assemblies (A-2 Units)	Pipe (Lin. Ft.)	Ventilation (V-2, S-2 Units)	Equiv. Ship Ratio
	Length (Ft.)	Breadth (Ft.)	Draft (Ft.)					
LST	567	68	15	6,607	950(1)	118,355	N/A	.64
AFS	581	79	24	5,170	290(1)	125,928	N/A	.90
AOR	659	96	33	8,661	600	183,977	500	2.18
AD	645	85	22	8,046	1,540	264,266	995	3.96
T-ARC	512	73	24	5,044	296	74,555	330	1.50
SCT	894	106	49	13,573	610	135,073	40	1.00
SDT	953	166	59	28,524	660	136,466	40	1.75
CPC	659	100	33	8,858	295	92,424	90	1.21
CT	689	90	35	6,619	400	117,972	40	.72
OBO	893	106	46	15,540	630	121,823	40	.96
LPC	659	106	36	9,291	335	86,898	73	.80
IPC	659	90	36	8,182	335	87,000	73	.82

(1) Estimate per Al Gillilan.

SHIP DESIGNATIONS

AFS	Combat Store Ship
LST	Landing Ship Tank
OBO	Ore Bulk Oil Carrier
CT	Coronado Class Tanker
SCT	San Clemente Class Tanker
SDT	San Diego Class Tanker
AD	Destroyer Tender
CPC	Carlsbad Class Product Carrier
T-ARC	Cable Repair Ship
IPC	Ingram Class Product Carrier
LPC	La Jolla Class Product Carrier

VII. YARD DATA

YARD UTILIZATION – SUMMARY

REF NO.	COMPONENTS	LIN. FT.	SQ. FT.	%
1	PRODUCTION			
	PRIMARY		1,063,103	23.9
	BLUE SKY		410,349	
	UNDER ROOF		212,610	
	PERMANENT BLDG.S		203,606	
	PORTABLE BLDG.S		8,921	
	BUILDING DOCK		166,600	
	BUILDING WAYS		252,900	
	DRY DOCK		20,697	
	BERTHS	6,355		
	SECONDARY		169,175	3.6
	BLUE SKY		156,194	
	UNDER ROOF		7,201	
	PERMANENT BLDG'S		3,716	
	PORTABLE BLDG'S		4265	
2	TRANSPORTATION		570600	12.8
	COLLOCATOR TRACKS		21,600	
	ROADWAYS		541,500	
	ROTATION PIT		7,500	
3	OFFICES		210,196	4.7
	PERMANENT BLDG.S		178,032	
	PORTABLE BLDG.S		32,164	
4	SERVICE AND SUPPORT		63,709	1.4
	BLUE SKY		34,075	
	UNDER ROOF		23,634	
	PERMANENT BLDG.S		26,806	
	PORTABLE BLDG.S		2,748	
5	PARKING		520,146	11.7
	PASSED VEHICLES		17,600	
	EMPLOYEE VEHICLES		502,546	

AUG. 1970

REF NO	COMPONENTS	LIN. FT.	SQ. FT	%
6	STORAGE		1859861	41.9
	BLUE SKY		1561,636	
	UNDER ROOF		298,225	
	TOTAL		4451,790	100%

BY: J.R. RUECKER
FILE DEPT.

PERMANENT BUILDINGS

AUG. 1980

BLDG NO	NAME	DIM.	SQ FT UTILIZATION: OFFICE	SQ FT UTILIZATION: MTL STORAGE	SQ FT UTILIZATION: MASONRY	SQ FT UTILIZATION: TOTAL	NO OF FLOORS	TYPE CONSTRUCTION	AGE	COND.	LOCATION: ON SITE	LOCATION: OFF SITE	SERVICE AVAILABLE: FRESH WATER GPM	FRESH WATER PSI	STEAM #/HR	STEAM PSI	AIR CFM	AIR PSI	ELECTRIC VOLTS	ELECTRIC AMP	OXYGEN SIZE	OXYGEN PSI	NAT. GAS SIZE	NAT. GAS PSI	ARGON SIZE	ARGON PSI	CO_2 SIZE	CO_2 PSI	CRANE SERVICE ≥ 3 TONS: NO.	CRANE SERVICE ≥ 3 TONS: TYPE	CRANE SERVICE ≥ 3 TONS: CAPACITY TONS	CRANE SERVICE ≥ 3 TONS: SPAN	SIDES: QTY.	SIDES: CAP. TONS
1	ADMINISTRATION	55 X 350	21,646	—	—	21,646	2	STUCCO	30	F	X		[illegible]	110	—	—	—	—	110 240	400	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	PLANT SHOP	70 X 300	322	—	21,846	22,168	1	METAL SIDING	181	F	X		400	110	—	—	1000	100	120 480	500 kVA	1/2	75	1/2	12	1 1/2	70	1/2	70	501 502 504 1010	BRIDGE	5	56	3 11 1	1 2 3
3	GALVANIZING BLUE SKY	25 X 60			1500	1500	1	METAL/WOOD	17	F	X		200	110	—	—	400	100	120 240	50	—	—	1	12	—	—	—	—	—	—	—	—	1	2
4	PIPE SHOP	114 X 183	970	—	22220	23190	1	METAL SIDING	30	G	X		200	110	—	—	250	100	120 240	200	1/2	75	1	12	1/2	70	1/2	70	2013 2014 2019	BRIDGE	3	56 225	8 11 1	1/2 1 2
5	MATL. EXPEDITING	19 X 21	665			665	2	WOOD	5	G	X		—	—	—	—	—	—	120	50	—	—	—	—	—	—	—	—	—	—	—	—	1	2
6	ELECTRICAL SHOP	55 X 350	9120	—	1540	11660	2	METAL SIDING	20	G	X		150	110			300	100	120 240	50	—	—	1	12	—	—	—	—	—	—	—	—	1 2 1	2 3 1/2
7	SHEET METAL SHOP		2559		31623 S-YARD	36191	1	METAL SIDING	20	G/F	X		90	110			1000	100	120 240	150	1/4	75	3/4	12	1/2	70	—	—	—	—	—	—	1	1/2
8	AIRLINE SHOP	180 X 230	33196	—	34542	69738	3	METAL/MASONARY	8	G	X		200	110			2000	100	120 240 480	480	—	—	1	12	—	—	—	—	1001 2002 2003 2004 2005 2006 2007	BRIDGE	5 20	90 56 112.5	5	1/2 1 1 1/2
9	FOUNDRY	75 X 150	—	—	10088	10088	1	METAL SIDING	30	P	X		400	110			400	100	120 240	100	1	75	1	12	—	—	—	—	2017 2018	BRIDGE	5 10	15.2	2 3	1 2
11	STOREROOM	90 X 165	982	—	13103	14090	2	METAL SIDING	201	F	X		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1
12	MAINTENANCE	35 X 200	2825	—	10975	13300	1	MASONRY	1920	F/G	X		100	110			500	100	120 240	50	—	—	1	12	—	—	—	—	—	—	—	—	2	1
13	MACHINIST BARREN	16 X 22	—	—	352	352	1	METAL SIDING	22	P	X		—	—	—	—	100	100	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	2
14	OUTFITTING OFC.	30 X 31	930	—	—	930	1	WOOD	21	P	X		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		
15	ADMIN. ANNEX	105 X 170	34608	—	—	34608	2	BRICK	1	E	X		100	110	—	—	—	—	120 240	100	—	—	1	12	—	—	—	—	—	—	—	—		
17	PAINT DIVISON	31 X 60	930	—	930	1860	1	WOOD	15	F	X		—	—	—	—	400	100	120	75	—	—	—	—	—	—	—	—	—	—	—	—		
18	LOCKERS	16 X 70	182	—	1538	1720	1	WOOD	201	P	X		—	—	—	—	—	—	120	50	—	—	—	—	—	—	—	—	—	—	—	—		

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FAIE DEPT.

PERMANENT BUILDINGS

AUG. 1980

BLDG NO	NAME	DIM.	SQ FT UTILIZATION				NO OF FLOORS	TYPE CONSTRUCTION	AGE	COND	LOCATION		SERVICE AVAILABLE														CRANE SERVICE ≥ 3 TONS				JIBS	
			OFFICE	MISC STORAGE	PRODUCTION	TOTAL					ON SITE	OFF SITE	FRESH WATER GPM	FRESH WATER PSI	STEAM PPH	STEAM PSI	AIR CFM	AIR PSI	ELECTRIC VOLTS	ELECTRIC AMP	OXYGEN SIZE	OXYGEN PSI	ACET. GAS SIZE	ACET. GAS PSI	ARGON SIZE	ARGON PSI	CO_2 SIZE	CO_2 PSI	NO.	TYPE	CAPACITY TONS	CAPACITY SPAN	QTY	CAP. TONS
19	CARPENTER SHOP	75X110	789	-	8801	9590	1	METAL SIDING	35	F	X		100	110			400	100	120 240	50	-	-	1	12	-	-	-	-	-	-	-	-		-
19A	CARPENTER ANNEX	40X90			3600	3600	1	METAL SIDING	1	E	X																							
20	WELD BLDG OFC	40X60	2685	-	-	2685	1	METAL SIDING	32	F	X		50	110	-	-	200	100	120	(1)	-	-	1	12	-	-	-	-	-	-	-	-		-
21	SHIPWAYS OFC	19X30	560	-	-	560	1	METAL SIDING	15	G/F	X		-	-	-	-	100	100	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
22	GIRL SCOUT DIV	46X111	621	-	2216	2837	1	WOOD	10	G	X		150	110	-	-	-	-	120	(1)	-	-	-	-	-	-	-	-	-	-	-	-		-
23	WASHROOM-WOMEN	13X30	-	-	390	390	1	WOOD	15	F	X		100	110	-	-	-	-	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
24	WASHROOM MEN	13X30	-	-	390	390	1	WOOD	15	F	X		100	110	-	-	-	-	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
26	MAIN ASSY. SHOP	30X150	2401	7049	2518	11968	2	STUCCO	12	F/G	X		-	-	-	-	-	-	120	(1)	-	-	-	-	-	-	-	-	-	-	-	-		-
27	RESTROOM - MEN	24X29	-	-	696	696	1	WOOD	15	F	X		100	110	-	-	-	-	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
28	TOOL ROOM 28TH ST.	8X49	-	-	392	392	1	WOOD	7	F/F	X		-	-	-	-	100	100	120	(1)	-	-	-	-	-	-	-	-	-	-	-	-		-
29	CARPENTER TOOL ROOM	7X87	-	-	609	609	1	METAL SIDING	15	F	X		-	-	-	-	100	100	120	(1)	-	-	-	-	-	-	-	-	-	-	-	-		-
31	PAINT LOCKER O/H	12X31	-	-	496	496	1	METAL SIDING	12	F/F	X		-	-	-	-	-	-	120	(1)	-	-	-	-	-	-	-	-	-	-	-	-		-
33	ELECTRONIC CLEANING	10X20	-	-	200	200	1	WOOD	5	G	X		-	-	-	-	-	-	120	(1)	-	-	-	-	-	-	-	-	-	-	-	-		-
42	YARD GUN. ROOM	65X75	3458	-	-	3458	1	WOOD	32	F/F	X		-	-	-	-	-	-	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
43	WAREHOUSE	100X130	2516	8300	9155	19971	1	METAL SIDING	151	G/F	X		50	100	-	-	-	-	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
44	WAREHOUSE	100X200	600	43800	-	50400	1	METAL SIDING	15	G/F	X		50	100	-	-	-	-	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
45	WAREHOUSE DEPT.	75X225	6192	11089	11089	28369	2	CONSTRUCTION	151	G/F	X		50	100	-	-	-	-	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
46	FIBERGLASS	17X26	442	-	612	1054	1	METAL SIDING	20	F/G	X		50	100	-	-	-	-	120	(1)	-	-	1/2	12	-	-	-	-	-	-	-	-		-
51	ENGINEERING	85X175	29750	-	-	29750	2	METAL SIDING	11	G	X		150	100	-	-	-	-	110	(1)	-	-	1	12	-	-	-	-	-	-	-	-		-

(1) .....AVERAGE FOR LIGHTS & EQUIPMENT

BY: J.R RUECKER
F.I.E. DEPT.

PERMANENT BUILDINGS

AUG 1980

BLDG NO	NAME	DIM.	SQ FT UTILIZATION: OFFICE	MFG STORAGE	PRODUCTION	TOTAL	NO OF FLOORS	TYPE CONSTRUCTION	AGE	COND.	LOCATION: ON SITE	LOCATION: OFF SITE	SERVICE AVAILABLE: FRESH WATER GPM	FRESH WATER PSI	STEAM #/HR	STEAM PSI	AIR CFM	AIR PSI	ELECTRIC VOLTS	ELECTRIC AMPS	OXYGEN SIZE	OXYGEN PSI	NAT. GAS SIZE	NAT. GAS PSI	ARGON SIZE	ARGON PSI	CO_2 SIZE	CO_2 PSI	CRANE SERVICE ≥ 3 TONS: NO.	TYPE	CAPACITY TONS	CAPACITY SPAN	DIES: QTY	DIES: CAP. TONS
54	[illegible] BUILDING	32 X 103	3068	-	-	3068	1	MASONRY	20	F	X		-	-	-	-	-	-	120	(1)	-	-	-	-	-	-	-	-	-	---	--	-	-	-
58	CARBON HOUSE	13 x 31	558	-	-	558	1	WOOD	15	F	X		-	-	-	-	-	-	110	(1)	-	-	-	-	-	-	-	-	-	---	--	-	-	-
59	HEAT STORAGE	23 X 40	-	-	920	920	1	METAL SIDING	18	F	X		-	-	-		-	-	120	(1)	-	-	-	-	-	-	-	-	-	---	-	-	-	-
60	FLAME PLANER SHED	40 X 60	-	2400	-	2400	1	METAL SIDING	15	F	X		50	110	-	-	200	100	110	(1)	1/2	75	1/2	12	-	-	-	-	-	---	-	-	-	-
61	[illegible] STORAGE BLDG	35 X 100	-	2000	1200	3200	1	STUCCO	15	F	X		130	110	-	-	-	-	120	(1)	-	-	-	-	-	-	-	-	-	---	-	-	-	-
62	WELDING SCHOOL	89 X 100	450	2931	5159	8540	1	METAL SIDING	10	F	X		-	-	-	-	200	100	120	(1)	1/2	75	1/2	12	1/2	70	1/2	70		-	-	-	-	-
66	TOOL ROOM DEC.	61 X 165	7167	-	5241	12408	2	METAL SIDING	20	F	X		-	-	-	-	-	-	110	(1)	-	-	-	-	-	-	-	-	-	---	-	-	-	-
68	COMPUTER SERVICES	110 X 240	8625	23075	-	31500	1	MASONRY	25	G		X	100	110	-	-	-	-	120 240	120	-	-	3/4	12	-	-	-	-	-	---	-	-	-	-
71	EM TO CARBIDE W.	30 X 31	600	-	330	930	1	WOOD	10	F	X		-	-	-	-	100	100	110	(1)	-	-	-	-	-	-	-	-	-	---	-	-	-	-
72	WAREHOUSE	-	-	24100	-	24100	1	MASONRY METAL	15	G		X	-	-	-	-	-	-	120	100	-	-	1/2	12	-	-	-	-	-	---	-	-	-	-
73	BOILER WAREHOUSE	40 X 142	840	6070	-	6910	2	METAL SIDING	15	F	X		200	110	-	-	200	100	110	(1)	1/2	75	1/2	12	1/2	70	1/2	70	-	---	-	-	-	-
74	WIRE HOUSE	-	-	72000	-	72000	1	TILT UP CEMENT	15	G		X	-	-	-	-	-	-	-	-	-	-					-	-	-	---	-	-	-	-
15	WARE HOUSE	-	-	40000	-	40000	1		15	G		X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	---	-	-	-	-
77	TOOL YARD CONTROL	23 X 31	651	-	-	651	1	WOOD	9	G	X		-	-	-	-	-	-	110	(1)	-	-	-	-	-	-	-	-	-	---	-	-	-	-
78	ADMINISTRATION BLDG	28 X 40	1120	-	-	1120	1	WOOD	10	G	X		-	-	-	-	-	-	120	50	-	-	1/2	12	-	-	-	-	-	---	-	-	-	-
79	MC CARPENTER SHOP	28 X 38	414	-	660	1074	1	WOOD	35	P	X			-	-	-	-	-	120	75	-	-	-	-	-	-	-	-	-	---	-	-	-	-
80	GATE #1 SECURITY	13 X 30	390	-	-	390	1	WOOD	12	F	X			-	-	-	-	-	120	30	-	-	-	-	-	-	-	-	-	---	-	-	-	-
81	GATE 4 SECURITY	10 X 20	200	-	-	200	1	WOOD	1	E	X		-	-	-	-		-	120	30	-	-	-		-					---			-	-

(1) [illegible] depending on choice of [illegible]

BY: J.R RUECKER
FIRE DEPT.

PERMANENT BUILDINGS

AUG. 1950

BLDG. NO.	NAME	DIM.	SQ FT UTILIZATION: OFFICE	SQ FT UTILIZATION: MISC. STORAGE	SQ FT UTILIZATION: PRODUCTION	SQ FT UTILIZATION: TOTAL	NO OF FLOORS	TYPE CONSTRUCTION	AGE	COND	LOCATION: ON SITE	LOCATION: OFF SITE	SERVICE AVAILABLE: FRESH WATER: GPM	FRESH WATER: PSI	STEAM: #/HR	STEAM: PSI	AIR: CFM	AIR: PSI	ELECTRIC: VOLTS	ELECTRIC: AMP	OXYGEN: SIZE	OXYGEN: PSI	NAT. GAS: SIZE	NAT. GAS: PSI	ARGON: SIZE	ARGON: PSI	CO_2: SIZE	CO_2: PSI	CRANE SERVICE ≥ 3 TONS: NO.	CRANE SERVICE ≥ 3 TONS: TYPE	CAPACITY: TONS	CAPACITY: SPAN
-	LEADSHOP	75X159	--	--	11850	11850	1	METAL SIDING	2	G	X		100	110	-	-	500	100	120 240	50	1/2	70	1	12	1/2	70	1/2	70				
-	INC. SHOP ANNEX	40X140	-	-	5600	5600	1	METAL SIDING	5	G	X				-	-			480		3/4	70	1	12			1/2	70	-	BRIDGE	5	170
-	WIRE IMAGE SHOP	100X220	-	46,800	-	-	1	BLOCK				X	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	SUB-TOTALS																															
	OFFICE		178032																													
	STORAGE			296713																												
	* PRODUCTION				203686																											
	** SECONDARY (LABORATORY)				3716																											
	SUPPORT				26914																											
	TOTAL					709833																										

BY: J. P. RUTGERS
F & I.E. DEPT

70.

PORTABLE BUILDINGS

AUG 1980

BLDG. NO.	UTILIZATION	DIMENSION	SQ. FT.	TYPE CONSTRUCTION	AGE	COND
1	WHEEL ABRATOR	8'X6'	48	WOOD		G
2	OFFICE - MGR Q.A	8'X6'	48			G
3	-	-	-			G
4	SHEET YARD OFFICE	10'X6'	60	STEEL		G
5	TABLE 9	10'X6'	60			G
6	ROD SHACK PANEL LINE	20-3'X8-3'	167	WOOD		G
7	TABLE 4	10-2'X8-2'	83			G
8	LOW TABLE	10'X8-1'	81			F
9	SUB ASSY AREA	10'X6'	60			F
10	PIPE FITTERS N/C	13-7'X7-6'	101			F
11	A.D. FIRE & SAFETY	20-3'X8-3'	167			G
12	ROD SHACK N/C	5-5'X5-5'	29	STEEL		F
13	ROD SHACK N/C	5-5'X5-5'	29			F
14	WELDING OFFICE N/C	5-5'X5-5'	29			P
15	PIPE FITTERS	8-3'X5-3'	43	WOOD		G
16	S/F OFFICE BAYS 3	16'X10'	160	STEEL		G
17	HULL DEPT.	20-3'X8-3'	167	WOOD		F
18	FITTERS	16'X10'	160			F
19	N/C COORDINATOR	8-3'X6-3'	52			G
20	ELEC. STORAGE	8-1'X16'	129			G
21	B/DOCK TOOL ROOM	32-2'X8-3'	265			F
22	B/DOCK MAIL/EXP.	4'X3-7'	14			F
23	B/DOCK S/F OFFICE	15-10'X10'	158	STEEL		F
24	ELEC. SHOP ANNEX N/C	10'X6'	60			F
25	O/S MACH TEST N/C	18-4'X10'	183	WOOD		G
26	A.D. PIPE DEPT. PRINT RM	14-2'X11-2'	158			G
27	PAINT DEPT.	12-1'X10'	121	STEEL		P
28	RIGGERS N/C	16-2'X10'	162			G
29	ROD SHACK N/C	21'X8-1'	170	WOOD		F
30	OUTFITTING (EXPEDITING)	16'X8-1'	129			F
31	LOCKER RM S/F & WELDER	28-4'X8-3'	234			P
32	PIPE BULL PEN STORAGE	11-5'X7-10'	89			P
33	PIPE BULL PEN OFFICE	12-2'X8-3'	100			P
34	OUTFITTING OFFICE	15-11'X8-2'	130			F
35	GUIDED SHACK SEA TRAILS NE	8-3'X6-3'	52			G
36	20TH ST FIRE EQUIP STORAGE	20'X12'	240			F
37	ELEC. STORAGE N/C	12-1'X10'	121			P
38	O/S MACH N/C	9-7'X7-8'	75	WOOD		F
39	O/S MACH N/C	15-6'X7-8'	119			P
40	TEMP ELEC. SERVICE	12-9'X10-2'	130			F
41	ROD SHACK & TOOL RM (FINGER PIER)	32-2'X8-3'	265			G
42	PIPE (PRE ERECTION OFC)	16-3'X8-3'	134			F
43	PIPE YARD ANNEX STORAGE	12-3'X8-3'	101			G
44	PAINT DEPT. STORAGE	8-10'X6-3'	55			G
45	MAINT DEPT. STORAGE (MAINT PIT	8'X5-6'	44			P
46	LAYOUT OFFICE	10-2'X4-1'	42			F
47	PAINT DEPT. 2ND SHIFT	4-9'X4-7'	31			F
48	PAINT STORAGE 2ND SHIFT	16'X8'	128			F
49	MAINT PIT OFFICE	12-3'X10-3'	126			G
50	MAT'L HANDLER	10'X6'	60	STEEL		G
51	LOCKER RM (TRANS)	26-8'X7-10'	209	WOOD		F
52	ROD SHACK (FENTON BLDG)	24'X8'	192			G
53	PLUMBER STORAGE (MAINT)	10-8'X8'	85			G
54	SANDBLAST EQUIP. RM	33-3'X24-3'	806			G
55	SANDBLAST SUPPLY RM	24-3'X10-3'	134			G
56	ELEC. MAINT. STORAGE	9-7'X8-3'	79			G
57	PIPE YARD OFFICE	10-3'X12-3'	126			E
58	FIRE DEPT. OFFICE	22-10'X12-4'	280			E
59	FIRE DEPT. STORAGE	16'X7-1'	112			G
60	NO LONGER EXISTING	-	-			-
61	ROD SHACK PLATE SHOP	16-3'X8-3'	113	WOOD		G
62	PLATE SHOP OFFICE	10'X6'	60	STEEL		F
63	FURNACE OFFICE	10'X6'	60			G
64	HULL EXPEDITION	8-1'X6-1'	49	WOOD		F
65	NO LONGER EXISTING	-	-	-		-
66	PAINT SHOP & STORAGE (@ RAILROAD)	18-2'X13-2'	239	WOOD		G
67	SPINNER OFFICE (@ SHIPWAY)	16-1'X10-2'	164			G
68	OFFICE - MAT'L COORD.	12-2'X10-2'	124			G
69	MAINT. OFFICE	14-2'X10-3'	145			G
70	MAINT TOOL RM OFFICE REPAIR	10'X8'	80	STEEL		F
71	TOOL RM (FINGER PIER)	29-10'X19-10'	583	WOOD		F
72	ELEC. OFFICE REP	10'X6'	60	STEEL		G
73	S/F & WELDER REP	16-2'X8-2'	132	WOOD		F
74	TOOL ROOM REP	20'X7-11'	158	STEEL		E

BY: J.R BUCKER
F & I E. DEPT.

PORTABLE BUILDINGS – CONT'D

AUG. 1980

BLDG. NO	UTILIZATION	DIMENSION	SQ. FT.	TYPE CONSTRUCTION	AGE	COND.
75	CARPENTER SHOP	12-1 X 8	97	WOOD		G
76	MACH. SHOP OFFICE REP	13-7 X 9-2	140	STEEL		F
77	MACH SHOP STORE REP RM	15-6 X 7-7	118	WOOD		P
78	MACH. STORE ROOM REP	5 X 7	35	STEEL		F
79	PIPE OFFICE REP	12-3 X 7-3	89	WOOD		P
80	PIPE SHOP REP STORE	17-3 X 10-1	174			P
81	WAYS DEPT. N/C	16-4 X 12-10	210			G
82	ELEC. SHOP REP 32ND ST	17-3 X 6-10	119			F
83	RIGGERS REP 32ND ST	8-9 X 4-6	38	STEEL		F
84	WAYS DEPT. REP 32ND ST	6-2 X 6-1	38	WOOD		F
85	-	-	-			G
86	WELDER'S REP 32ND ST	5-5 X 5-5	29	STEEL		F
87	SANDBLAST MAT/CONTROL	12-3 X 8-3	101	WOOD		G
88	NASSCO INSP. REP 32ND ST	12-3 X 8-3	101			G
89	-	-	-			G
90	-	-	-			G
91	WELDERS REP/DEPT	12-2 X 7-10	95			G
92	TIDELANDS	16-2 X 8-3	133			G
93	TOOL RM & PORTA POWER REPAIR	11-7 X 11-5	253	STEEL		G
94	MACHINERY	24-2 X 10-2	246	WOOD		G
95	MACHINIST'S COMP	12-2 X 10-2	124			E
96	N/C MGMT PROD	24-2 X 12-2	294			E
97	FIRE DEPT	18-2 X 14-2	257			E
98	O/S MACH. REPAIR	14-1 X 7-8	108	STEEL		G
99	ELECT SHOP REPAIR	16-3 X 7-8	124	WOOD		F
100	TRAILER "11 MAT/EXP	22 X 9-11	218	STEEL		E
101	CARP/NC PALLET COVER 28TH ST	18-9 X 16	293	WOOD		G
102	OUTFITTING	10-3 X 8-3	85			G
103	N/C CARP SHOP ANNEX	8 X 8-1	65			G
104	MII TRAILER	60 X 12	720	STEEL		G
105	SANDBLAST	48 X 48	2304			G
106	ASTER FLOORING	15 X 24	370	WOOD		G
107	CAT 160	8 X 16	128			G
108	TELEPHONE STORAGE	10 X 30	300			G
109	SHEETMETAL SHOP	8 X 8	64			F
110	SHIPWRIGHTS OFFICE	8 X 11	64	STEEL		P
111	PAINT DEPT STORAGE	10 X 8	80			P

BLDG. NO.	UTILIZATION	DIMENSION	SQ. FT	TYPE CONSTRUCTION	AGE	COND
112	-	4 X 4	16	WOOD		G
113	WELD DEPT.	5 X 5	25	STEEL		P
114	PAINT DEPT. STORAGE	8 X 6	48			P
115	WELD DEPT.	8 X 6	48			P
116	TEMP. ELECTRIC STORAGE	12 X 10	120	WOOD		G
117	PAINT DEPT. OFC.	8 X 6	48			F
118	FIRE ALARM FIMER PIER	16 X 7	112	WOOD	1	G
119	SHIP COORDINATION	10 X 7	70	STEEL	1	G
120	REST ROOM	12 X 10	120		1	G
121	LUNCH AREA	26 X 26	676	WOOD	1	G
122	LUNCH AREA	26 X 26	676		1	G
123	ROD SHACK					
124	SANDBLAST	12 X 10	120	WOOD	1	G
125	REST ROOM	10 X 12	120	ALUM./STEEL	1	E
126	REST ROOM	10 X 12	120		1	E
127	REST ROOM	10 X 12	120		1	E
128	REST ROOM	10 X 12	120		1	E
129	LUNCH ROOM	32 X 26	832	WOOD	1	G
130	LUNCH ROOM	32 X 26	832		1	G
131	PIPE	12 X 8	96		1	F
132						
		OFFICE	4482			
		STORAGE	1512			
		PRIM. PRODUCTION	8924			
		SECO. PRODUCTION	4265			
		SUPPORT	2748			
		TOTAL	21931			

BY. J.R RUFCVER
FILE DEM

TEMPORARY OFFICE TRAILERS

AUG 1980

TRLR NO.	OCCUPANTS / USE	LOCATION	DIMENSION FT	SQ. FT.	REFRIGERATION EQUIVALENCE SQ. FT.	
1	STAFF	BLDG. 1	10 X 55	550	650	
3	MTL. COST ANALY / PURCH	BLDG 1	10 X 45	450	550	
5	PUBLIC RELATIONS	BLDG. 1	10 X 55	550	650	
9	M-K	BLDG. 51	10 X 55	550	650	
11	AD NUCLEUS CREW	BLDG 51	50 X 55	2750	1050	
13	LEAD SHOP	AD LEAD SHOP	10 X 45	450	550	
14	FAC. E. & E.	BLDG. B	10 X 55	550	650	
17	PIPE SHOLERS	BLDG. 1	24 X 60	1440	840	
19	STORE	EXEC LOT	10 X 55	550	650	
22	Q.A.	BLDG B	30 X 60	1800	900	
23	AD 93 PERSONNEL	LEAD SHOP	12 X 60	720	720	
25	ADVANCED PLANNING	BLDG B	12 X 60	720	720	
26	NAVY Q.A.	BUILDING DOCK	12 X 56	672	680	
27	T-ARC	BLDG B	12 X 60	720	720	
28	OUTFITTING MACHINIST	BLDG 14	10 X 55 (2)	1100	1300	
29	P/P	BLDG B	12 X 60	720	720	
30	P/P	BLDG. B	12 X 60	720	720	
31	MEDICAL	BLDG. 15	10 X 55	550	650	
32	ENG - MACH PIPE	BLDG 51	24 X 60	1440	840	
34	ENG - HULL STRUCT - T ARC	BLDG. 51	12 X 60	720	720	
24	ENG - MACH MECH	BLDG. 51	12 X 60	720	720	
35	DCAA	BLDG. 1	10 X 55	550	650	
36	ELECT. TRNG	BOILER SHOP	12 X 60	720	720	
37	MAT'L. HANDLING	BLDG 51	12 X 60	720	720	
38	Q.A. NUCLEAR	BLDG 54	12 X 60	720	720	
39	VENDOR REPS	BLDG 54	12 X 60	720	720	
40	PERSONNEL	BLDG. 15	10 X 35	350	450	
41	T-ARC	BLDG. B	12 X 60	720	720	
42	P/P	BLDG. B	24 X 60	1440	840	
43	SHIP COORDINATION	WAYS 3 & 4	10 X 55	550	650	
44	TEST COORDINATION	BLDG 7	12 X 60	720	720	
45	ENG HULL	BLDG. 51	24 X 60	1440	840	
46	FAC E & E	BLDG B	10 X 43	430	530	
47	MACHINERY PARTS STR	BERTH 1	8 X 20	160	280	
			TOTAL	27,602	29,210	= 51,892 SQ FT.

BY: J.R RUECKER
F & E DEPT.

BUILDING DOCK AND WAYS

NO	TYPE	LAUNCHING END	LAUNCHING SIDE	LAUNCHING DIAGONAL	DIMENSIONS LENGTH	DIMENSIONS WIDTH	DIMENSIONS DEPTH	MAX SHIP SIZE LENGTH O.A.	MAX SHIP SIZE BEAM	MAX SHIP SIZE DISPLACEMENT TONS	DEPTH OVER SILL	DEPTH OVER KEEL BLOCKS	AGE	COND	SERVICE AVAILABLE FRESH WATER GPM	FRESH WATER PSI	STEAM #/HR	STEAM PSI	AIR CFM	AIR PSI	ELECTRIC VOLTS	ELECTRIC AMP	OXYGEN SIZE	OXYGEN PSI	NAT. GAS SIZE	NAT. GAS PSI	ARGON SIZE	ARGON PSI	CO_2 SIZE	CO_2 PSI
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1	DOCK			X	1000'	170'	-0- (FLOOR)	980'	170'	100,000	-26'	-	5	G	400	110	-	-	1000	110	120 480	1250 KVA	1	75	1	12	1 1/2	70	1/2	70
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	WAYS	X			695'	95'	-	690'	90'	90000	11'	-8'	20	F	400	110	-	-	1000	110	120 480	3000 KVA	1	75	1	12	1 1/2	70	1/2	70
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	WAYS	X			906'	115'	-	900'	106'	90,000	-9'	-14'	13	G	400	110	-	-	1000	110	110 480	1200 KVA	1	75	1	12	1 1/2	70	1/2	70
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	WAYS	X			905'	115'	-	900'	106'	90,000	9'	14'	13	G	400	110	-	-	1000	110	120 480	1200 KVA	1	75	1	12	1 1/2	70	1/2	70

NO	TYPE	CRANE CAPACITY (1) LIFT CAPACITY AIRIAL TONS	AIRIAL FT	AIRIAL TO	WHIP TONS	WHIP FT	WHIP TO	TRACK CAP WEST	TRACK CAP SOUTH
2,3,4	LIMITED	60	35	17	95	15	96	9	115	100	100
5		45	45	10	120	-	-	9	130		
6		50	40	12	110	-	-	10	130		
7,8,9		54	40	12	130	21	100	6	165		
10,11		95	35	210	160	25	55	199	160		
12		175	45	175	190	-	-	325	155		
2,3,4		60	35	17	95	15	96	9	115	100	100
5		45	45	10	120	-	-	9	130		
6		50	40	12	110	-	-	10	130		
7,8,9		54	40	12	130	21	100	6	165		
10,11		95	35	210	160	25	55	199	160		
12		175	45	175	190	-	-	325	155		
2,3,4		60	35	17	95	15	96	9	115	70	100
5		45	45	10	120	-	-	9	130	100	
6		50	40	12	110	-	-	10	130		
7,8,9		54	40	12	130	21	100	6	165	60	
10,11		95	35	210	160	25	55	199	160	R	
12		175	45	175	190	-	-	325	155	P	
2,3,4		60	35	17	95	15	96	9	115	100	70
5		45	45	10	120	-	-	9	130		100
6		50	40	12	110	-	-	10	130		
7,8,9		54	40	12	130	21	100	6	165		60
10,11		95	35	210	160	25	55	199	160		R
12		175	45	175	190	-	-	325	155		P

(1) MOBILE CRANES SUPPLEMENT THE WHIRLEY FLEET.
P PROHIBITED
R RESTRICTED - LIMIT TRAVEL SPEED TO 200 FPM OR LESS, TRAVEL WITH BOOM PARALLEL TO TRACK, CONDUCT ALL LOAD HANDLING MOVEMENTS VERY SLOWLY.

DRYDOCK

TYPE	NO	LENGTH INSIDE FLOATER OVER KEEL BLOCKS	MAXIMUM DEPTH OVER BLOCKS	CLEAR WIDTH BETWEEN WINGWALLS	LIFT CAPACITY (TONS)	NORMAL KEEL BLOCK HEIGHT	MAXIMUM SHIP SIZE (1)	FRESH WATER GPM	FRESH WATER PSI	STEAM #/HR	STEAM PSI	AIR CFM	AIR PSI	ELECTRIC VOLTS	ELECTRIC AMP	OXYGEN SIZE	OXYGEN PSI	NAT. GAS SIZE	NAT. GAS PSI	ARGON SIZE	ARGON PSI	CO_2 SIZE	CO_2 PSI
FLOATING DRYDOCK A.	MDL-37	345'-6"	19'	58'	2,800	4'	337' x 52'	300	110	-	-	500	110	480	1050	1/2	75	1/2	12	-	-	-	-
GRAVING DRY DOCK B	#1	680' 3"	36' 6"	36'-6"	N/A	5'-11"	680' L x 91'	1000	110	[illegible]	100	350	125	480	2400	N/A		N/A		N/A		N/A	

(1) LENGTH OVER BLOCKS PLUS 15%

CRANE SERVICE

NO.	TYPE	CAPACITY LIFT TONS	CAPACITY STEAM (#/hr) (1)
3701	PORTAL	13.5	42
3701	PORTAL	17.2	50

BY: J R RUECKER
I & E, DCN.

BERTHS

AUG. 1980

NO.	TYPE	LENGTH (FEET) OVERALL	LENGTH (FEET) USABLE	WATER DEPTH (FEET) ALONGSIDE	WATER DEPTH (FEET) APPROACH	HEIGHT OF DOCK	AGE	COND	SERVICE AVAILABLE: FRESH WATER GPM	FRESH WATER PSI	STEAM #/HR	STEAM PSI	AIR CFM	AIR PSI	ELECTRICAL VOLTS	ELECTRICAL AMPS	OXYGEN SIZE	OXYGEN PSI	NAT. GAS SIZE	NAT. GAS PSI	ARGON SIZE	ARGON PSI	CO_2 SIZE	CO_2 PSI
1	WHARF	600	620	-20	-20	112	30	G	900	130	(1)(3)	125	1000	100	180	902	1½"	150	2"	20	¾"	85	¾"	85
2	WHARF/PIER	775	910	-30	-30	112	30	G	900	130	(1)(3)	125	2000	100	480	2105	1½"	150	2"	20	¾"	85	¾"	85
3	PIER	540	560	-30	-30	112	10	G	1000	130	(1)		1200	100	480	1301	1½"	150	2"	20	¾"	85	¾"	85
4		540	560	-30	-30				1000	130	(1)		1200	100	480	1801	1½"	150	2"	20	¾"	85	¾"	85
5	PIER	910	965	-20	-25	112	8	G	900	130	(1)		3000	100	480	1804	2"	150	2	20	¾	85	¾"	85
6		910	965	-20	-25				900	130	(1)		3000	100	480	1804	2"	150	2	20	¾"	85	¾"	85
7	WHARF	350	350	-20	-20	112	6	G	900	130	(1)		1200	100	480	900	1½"	150	1½"	20	NONE		NONE	
8	WHARF	300	300	-20	-20	112	6	G	450	130	(1)		600	100	480	180	1"	150	1½"	20	NONE		NONE	
9	PIER	675	650	-20	-22	112	1	E	1200	130	(1)		1000	100	450	1773	1½"	150	1½"	20	NONE		NONE	
10		825	775	-20	-22				1200	130	(1)		1000	100	480	1773	1½"	150	1½"	20	NONE		NONE	

NO.	TYPE	% CUR. ALLOW.	CRANE SERVICE (2) LIFT CAPACITY: MAIN TONS	MAIN FT	MAIN TO	WHIP TONS	WHIP FT	WHIP TO
2,3,4	GANTRY	100	60	35	17	95	15	96
5		100	45	45	10	120	-	-
6		100	50	40	12	110	-	-
1,8,9		100	54.4	40	12	130	21	100
10,11		100	95	35	21.8	140	25	55
12		100	175	45	42.5	110	-	-
2,3,4		70	60	35	17	95	15	96
5		100	45	45	10	120	-	-
6		100	50	40	12	110	-	-
7 8 9		55	54.4	40	12	130	21	100
2,3,4		100	60	35	17	95	15	96
5		100	45	45	10	120	-	-
6		100	50	40	12	110	-	-
7,8,9		90	54.4	40	12	130	21	100
2,3,4		100	60	35	17	95	15	96
5		100	45	45	10	120	-	-
6		100	50	40	12	110	-	-
7,8,9		100	54.4	40	12	130	21	100
2,3,4		100	60	35	17	95	15	96
5		100	45	45	10	120	-	-
6		100	50	40	12	110	-	-
1,8,9		100	54.4	40	12	130	21	100
10,11		100	95	35	21.8	140	25	55
12		100	175	45	42.5	110	-	-
75	MOBILE	100	18	10	1.0	65	-	-
271		100	9.5	10	.5	48	-	-
273		100	18	10	1.0	65	-	-
75		100	18	10	1.0	65	-	-
271		100	9.5	10	.5	48	-	-
273		100	18	10	1.0	65	-	-

NOTE: SALT WATER SERVICED BY PORTABLE UNITS 1000 GPM @ 100 PSI.

(1) SUPPLIED BY ANY OF THE FOLLOWING (A) PORTABLE BOILERS (A) 50 HP - 1725 #/HR @ 100 PSI, (B) 200 HP - 6900 #/HR @ 130 PSI, (C) 50 HP - 1725 #/HR @ 125 PSI, (D) 50 HP - 1035 #/HR @ 100 PSI.

(2) MOBILE CRANES SUPPLEMENT THE WHIRLEY FLEET.

BY: J R ROECKER
F.I.E. DEPT.

PRODUCTION AREA'S - BLDG. 51 Y

AUG. 1980

REF NO.	TYP PRIM	TYP SECON	LOCATION	DESCRIPTION	SQ. FT.
G-1	X		STEEL YARD	WHEELABRATOR	2,257
G-2	X		CRANE WAY 2009	ROLL FORM	6400
G-3	X		BLDG. 4	GALVANIZING	1800
G-4	X		[illegible] OF YARD	PAINT	32500
G-5	X		EAST END OF YARD	GRIT BLAST	99,800
G-6	X		29TH ST PIER	PAINT	13,437
				SECONDARY TOTAL	156,194
S-1		X	CRANE WAY 2009	PLATEN 1	43,450
S-2		X	HAMMERHEAD CRANE	PLATEN 2	23,672
S-3		X	HAMMERHEAD CRANE	PLATEN 3	6,077
S-4		X	PILLAR JIB	PLATEN 4	9,918
S-5		X	SOUTH OF BLDG 12	PLATEN 5	15,222
S-6		X	NORTH OF BLDG. 61	PLATEN 6	15,222
S-7		X	EAST OF BLDG. 61	PLATEN 7	6,240
S-8		X	EAST OF BLDG. 26	PLATEN 8	6322
S-9		X	CRANE WAY 500	PLATEN 9	12,255
S-10		X	CRANE WAY 591	PLATEN 10	11,020
S-12		X	CRANE WAY 2000	CM-100	3,120
S-13		X	CRANE WAY 2000	CM-150	2,730
S-14		X	CRANE WAY 2000	CM-160	3,080
S-15		X	CRANE WAY 2000	PANEL LINE	18,750
S-16		X	CRANE WAY 591	FRAME BENDER	5,890
S-17		X	CRANE WAY 591	SHAPES LAYOUT	2,230
S-18		X	CRANE WAY 598	CM-56	160
S-19		X	CRANE WAY 595	CM-60 - PLANER	3,200
S-20		X	CRANE WAY 593	CM-60 - CUTTER	3,600
S-21		X	EAST OF BLDG 60	CM-60 - STRAIGHTENER	2250
S-22		X	CRANE WAY 501	TEE WELDER	6875
S-23		X	CRANE WAY 501	BEAM BURNING	4000

REF NO.	TYPE PRIM.	TYPE SECON	LOCATION	DESCRIPTION	SQ. FT.
S-24		X	CRANE WAY 2008	CM-70	6000
S-25		X	CRANE WAY 2010/2011	FURNACE / BRAKE AREA	8,800
S-26		X	CRANE WAY 511/574	SMALL ASSEMBLIES	9,750
S-27		X	CRANE WAY 510/1018	LARGE ASSEMBLIES	31,500
S-28		X	BLDG. 4	PIPE SHOP WORK AREA	6,750
S-29		X	BLDG. 3	FOUNDRY WORK AREA	8,750
S-30		X	PLATEN 6	PLATEN WORK AREA	5000
S-31		X	NORTH OF BLDG. 42	PIPE ANNEX I	13,050
S-32		X	N/E OF BLDG. DOCK 1	MACH. PRE-ERECTION	29,750
S-33		X	BLDG. 7	METAL SHOP WORK AREA	3,500
S-34		X	BLDG. 46	FIBERGLASS WORK AREA	1,500
S-35		X	BLDG. 73	BOILER ERECTION	23,453
S-36		X	N/E OF WAYS 2	PRE-ERECTION	11,700
S-37		X	N/E OF WAYS 3	PRE-ERECTION	27,713
S-38		X	N/E OF WAYS 4	PRE-ERECTION	12,150
				PRIMARY TOTAL	410,779

BY: J.R RUECKER
I & I.C. DEPT.

STORAGE AREAS - BLUE SKY

AUG. 1980

REF. NO.	LOCATION	USAGE	OUTSIDE STORAGE YES	OUTSIDE STORAGE NO	SQ. FT.
1	STEEL YARD	RAW PLATES	X		182125
2	STEEL YARD	RAW SHAPES			15,937
3	STEEL YARD	PLATE & SHAPES ALUMINUM			19,062
4	STEEL YARD	PLATE & SHAPE REMNANTS			8099
5	STEEL YARD	RECLAMATION			11,030
6	BLDG. 11	INPROCESS STORAGE			11,325
7	BLDG. 11	WAREHOUSE			1756
8	BLDG. 19	INPROCESS STORAGE			8,450
9	MARINE RAILWAY	INPROCESS STORAGE			11,030
10	CRANE WAYS 2000	INPROCESS STORAGE			22,810
11	PLANT-9	INPROCESS ASSEMBLIES			16,125
12	CRANE WAYS 591	PLATE STORAGE			12000
13	CRANE WAYS 591	SHAPES STORAGE			6750
14	CRANE WAYS 591	INPROCESS SHAPES			1250
15	CRANE WAYS 591	INPROCESS ASSEMBLIES			1250
16	GATE 14	INPROCESS RAW STOCK			4000
17	GATE 10	INPROCESS ASSEMBLIES			61563
18	CM-56	INPROCESS PLATES			3000
19	BLDG. 1	INPROCESS ASSEMBLIES			6,250
20	BLDG. 2	DIE'S			5625
21	CM-10	INPROCESS PLATES			10,687
22	ROLLS	INPROCESS PLATES			10,750
23	BLDG. 4	INPROCESS PIPES			11300
24	BLDG. 9	INPROCESS PIPES			8,125
25	BLDG. 8	INPROCESS - MACH. SHOP			22250
26	BLDG. 33	BOILER STORAGE			4082
27	BLDG. 6	INPROCESS - ELECT.			22500
28	BLDG. 26	INPROCESS - ELECT			5,750
29	PLANT-1-8	INPROCESS STORAGE			19,737
30	PLANT-1-2-3	INPROCESS STORAGE			2400
31	FRONT OF WAYS 4	INPROCESS			800
32					
33					
34	SIDES OF WAYS 4	INPROCESS		X	19,125
35	SIDES OF WAYS 3	INPROCESS			17,000
36	SIDES OF WAYS 2	INPROCESS			19,000
37	BETWEEN WAYS 2 & DOCK 1	INPROCESS	X		39,962
38	PIPE ANNEX 1	INPROCESS STORAGE	X		24,425
39	BLDG. 17	PAINT STORAGE			1,550
40	20 TON ST. TIER	INPROCESS STORAGE			1,937
41	20 TON ST. PIER	RIGGING STORAGE			19,500
42	BLDG. 7	INPROCESS - SHEET METAL			31,525
43	BLDG 13	INPROCESS STORAGE			6,250
44	BLDG 13	CARPENTER SHOP STORAGE			3000
45	BLDG 64	MACH BULLPEN STORAGE			3700
46	BERTH-I	INPROCESS STORAGE		X	8912
47	BERTH-II	INPROCESS STORAGE			9000
48	BERTH-III & IV	INPROCESS STORAGE			23100
49	BERTH-V & VI	INPROCESS STORAGE			19125
50	BLDG. 12	MAINT. STORAGE	X		15000
51	PIPE ANNEX-II	WAREHOUSE - PIPE			20172
52	BLDG. 61	INPROCESS STORAGE			6,000
53	BLDG. 53	INPROCESS STORAGE			17,000
54	BLDG. 13	WAREHOUSE			12,500
55	BLDG. 14	WAREHOUSE			11,976
56	BLDG. 15	RECEIVING			14875
57	BLDG. 15	WAREHOUSE			28592
58	BLDG. 15	INPROCESS STORAGE			12,375
59	PLANT 1	INPROCESS STORAGE			11250
60	GANTRY TRACKS	INPROCESS STORAGE		X	111,250
61	TIDE LANDS	WAREHOUSE	X		261,878
62	OPEN AREA BLDG. 14	INPROCESS STORAGE			64,033
63	OPEN AREA BLDG. 12	INPROCESS STORAGE			65340
64	OPEN AREA BLDG 18	INPROCESS STORAGE			37,026
		SUB-TOTAL			1635,159
		REDUCED BY			
		OFC. TRAILERS			51,892
		PORTABLE BLDG			21,931
		TOTAL			1,561,036

BY J.R RUECKER
I.E. Dept.

TRANSPORTATION

AUG. 1980

REF. NO.	DESCRIPTION	SQ. FT.
T-1	COLLOCATOR TRACKS	21,600
T-2	ROADWAYS	541,500
T-3	ROTATION PIT	7,500
	TOTAL	570,600

BY: J.R RUECKER.
F & E DEPT.

SERVICE AND SUPPORT - BLUE SKY

REF. NO.	LOCATION	DESCRIPTION	SQ FT.
S-1	GATE - 11	FIRE DEPT.	3125
S-2	BLDG. - 10	WAYS REPAIR AREA	1625
S-3	GATE - 6	UTILITIES	2,500
S-4	BLDG. 12	MAINTENANCE YARD	3,375
S-5	BLDG. 42	CO$_2$ & ARGON TANKS	7500
S-6	28 ST. PIER	COMPRESSOR	3000
S-7	BLDG. 13	CARPENTER SHOP REPAIR	2400
S-8	BLDG. 11	MACHINIST BULL PEN	8750
S-9	28 ST. PIER	BOILER	1600
		TOTAL	34,075

PARKING

BLDG. - 1980

REF. NO.	TYPE YARD	TYPE EMPL	LOCACTION / DESCRIPTION	NO. SPACES	SQ FT.
P-1	X		ADMIN. ANNEX	OPEN	5000
P-2	X		TRANSP. DEPT	OPEN	12,600
P-3		X	EXECUTIVE LOT - BLDG 1	39	14,800
P-4		X	EXECUTIVE & VENDOR LOT - GATE 6	41	16125
P-5		X	LOT #1	246	64,452
P-6		X	LOT #2	95	30,000
P-7		X	LOT #3	6	1170
P-8		X	LOT #4	51	14,000
P-9		X	LOT #5	272	82,520
P-10		X	LOT #6	828	122600
P-11		X	LOT #7	124	35,000
P-12		X	MAIN LOT	265	93375
P-13		X	BELT ST.	41	14,244
P-14		X	GATE 2	23	3240
			TOTAL		520,747

BY: J.R. ROECKER

CRANES – GANTRY

AUG. 1980

CRANE NO.	TYPE	POWER SOURCE	AGE	COND	CAPACITY MAIN TONS	MAIN FT.	TO	MAIN TONS	MAIN FT.	WHIP TONS	WHIP FT.	TO	WHIP TONS	WHIP FT.	SERVICE AREA[1]
2	CLYDE	DIESEL	40	G	60	35		17	95	15	96		9	115	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT 40% CAP. BERTH II,
3	CLYDE	DIESEL	40	G	60	35		17	95	15	96		9	115	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT 40% CAP. BERTH II,
4	CLYDE	DIESEL	40	G	60	35		17	95	15	96		9	115	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT 40% CAP. BERTH II,
5	CLYDE	DIESEL	40	G	45	45		10	120	—	—		9	130	ANY AREA WITHIN REACH OF RAIL NETWORK.
6	WASHINGTON	DIESEL	38	G	50	40		12	110	—	—		10	130	ANY AREA WITHIN REACH OF RAIL NETWORK.
7	CLYDE	DIESEL	15	G	54.4	40		12	130	21	100		6	165	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT 55% CAP. ON BERTH II, 20% CAP. ON BERTHS III & IV.
8	CLYDE	DIESEL	15	G	54.5	40		12	130	21	100		6	165	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT 55% CAP. ON BERTH II, 20% CAP. ON BERTHS III & IV.
9	CLYDE	DIESEL	15	G	54.5	40		12	130	21	100		6	165	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT 55% CAP. ON BERTH II, 20% CAP. ON BERTHS III & IV.
10	CLYDE	DIESEL	9	G	95	35		21.8	160	25	55		13.9	160	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT PROHIBITED ON BERTHS II, III, IV, X, XI, & TURNTABLE.
11	CLYDE	DIESEL	9	G	95	35		21.8	160	25	55		13.9	160	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT PROHIBITED ON BERTHS II, III, IV, X, XI, & TURNTABLE.
12	CLYDE	DIESEL	5	G	175	45		47.5	140	—	—		37.5	155	ANY AREA WITHIN REACH OF RAIL NETWORK EXCEPT PROHIBITED ON BERTHS II, III, IV, X, XI, TURNTABLE

(1) DWG. NO. 111-60-688 ILLUSTRATES DETAIL OF CRANE LOAD & TRAVEL CONSTRAINTS.

CRANES – MOBILE

CRANE NO.	TYPE	POWER SOURCE	AGE	COND	CAPACITY TONS	CAPACITY FT.	TO	CAPACITY TONS	CAPACITY FT.	SERVICE AREA
75	GROVE "HYDRO"	DIESEL	5	G	18	10		1.0	65	NO LIMIT ON SERVICE AREA
271	HY-DYNAMIC "HYDRO"	DIESEL	3	F	9.5	10		0.5	48	NO LIMIT ON SERVICE AREA
273	GROVE "HYDRO"	DIESEL	5	G	18	10		1.0	65	NO LIMIT ON SERVICE AREA
284	P & H "HYDRO"	DIESEL	6	F	35	12		7.5	70	NFDL-37 (ON BRIDGE)
607	UNIT "TRUCK"	DIESEL			10	15		0.75	60	TIDELAND STORAGE — NATIONAL CITY
628	UNIT "TRUCK"	DIESEL	28	F	10	15		0.75	60	STEEL YARD

BY: J.R. BUCKER
E & I.E DEPT.

CRANES – OTHERS ≥ 3 TONS CAPACITY

AUG. 1980

CRANE NO.	TYPE	POWER SOURCE	CAPACITY TONS	CAPACITY SPAN/RADIUS(ft)	MAGNETIC	SERVICE AREA
1	HAMMERHEAD	440V	4	48		PLATENS 2 & 3
1A	PILLAR JIB	440V	5	100		PLATEN 4
500	SEMI-GANTRY	480V	25	65		PLATEN 9
501	BRIDGE	480V	5	56.2		PREFABRICATION – TEE WELDER & BLDG. 2
502	BRIDGE	480V	5	56.2		PREFABRICATION – BLDG. 2 – PLATE SHEAR, ANGLE SHEAR, C-PRESS, BULLDOZER, PLATE ROLLS
507	CANTILEVER GANTRY	480V	15	210	*	STEEL PLATE STORAGE
511	SEMI-GANTRY	480V	3	30		PREFABRICATION
560	BRIDGE	480V	5	56.2		PREFABRICATION & BLDG 2
574	SEMI-GANTRY	480V	5	30		PREFABRICATION
591	BRIDGE	240V-D.C.	10	80	*	PREFABRICATION & PLATEN 10
591A	BRIDGE	480V	10	80		PREFABRICATION & PLATEN 10
595	SEMI-GANTRY	480V	5	39		CM-60 FLAME PLANER, CM-60 CUTTING MACHINE
598	BRIDGE	480V	3	21.5		CM-56 SHAPE CUTTER
1048	BRIDGE	480V	5	56.2		PREFABRICATION & BLDG. 2
2000	BRIDGE	480V	10	80	*	CM 100 FLAME PLANER, CM-150 SHAPE CUTTER, CM-160 SHAPE CUTTER, & PANEL LINE
2001	BRIDGE	440V	5	40		MACHINE SHOP BLDG. 8
2002	BRIDGE	440V	5	40		MACHINE SHOP BLDG. 8
2003	BRIDGE	480V	5	56		MACHINE SHOP BLDG. 8
2004	BRIDGE	480V	5	56		MACHINE SHOP BLDG. 8
2005	BRIDGE	480V	5	42.5		MACHINE SHOP BLDG. 8
2006	BRIDGE	480V	20	42.5		MACHINE SHOP BLDG. 8
2007	BRIDGE	480V	20	42.5		MACHINE SHOP BLDG. 8
2008	SEMI-GANTRY	480V	10	88.5	*	PLATEN 1 & CM-70 SHAPECUTTER
2009	SEMI-GANTRY	480V	10	88.5	*	PLATEN 1 & PLATE ROLLS
2010	SEMI-GANTRY	480V	10	40.8		BLACKSMITH SHOP – PRESS BRAKE & PLATE ROLLS
2011	SEMI-GANTRY	480V	10	40.8		BLACKSMITH SHOP – PLATE ROLLS & FURNACE
2013	BRIDGE	480V	3	35.1		PIPE SHOP BLDG 4
2014	BRIDGE	480V	3	35.1		PIPE SHOP BLDG. 4
2017	BRIDGE	480V	5	35.2		FOUNDRY BLDG. 9
2018	BRIDGE	480V	10	35.2		FOUNDRY BLDG. 9
2019	BRIDGE	230V	3	21.5		PIPE SHOP BLDG. 4
3701	PORTAL	DIESEL	13.5	42		AFDL-37 DRYDOCK
3702	PORTAL	DIESEL	19.2	50		AFDL-37 DRYDOCK
593	SEMI-GANTRY	480V	2	39	*	CM-60 FLAME PLANER, CM-60 CUTTING MACHINE

BY: J.R. RUECKER
F.I.E DEPT.

CRANES – JIB

BLDG. 1980

HOIST	QTY	CAPACITY (TONS)	SWING (DEGREES)	BOOM L (FT)	BOOM H (FT)	POWER SOURCE	MONORAIL TRAVEL	LOCATION
BUDGET	1	1	180	10	10	ELEC.	-	BLDG. 11
BUDGET	1	1	—	—	10	ELEC.	35 FT.	BLDG. 11
YALE	1	1	180	15	10	ELEC.	—	BLDG. 8 (OUTSIDE)
YALE	1	1/2	180	15	12	ELEC.	—	BLDG 8
YALE	3	1/2	180	15	20	ELEC.	—	BLDG. 8
YALE	1	1/2	—	—	12	CHAIN HOIST	20 FT.	BLDG. 8
N/A	1	N/A	—	—	25	N/A	25 FT.	BLDG. 8
BUDGET	4	1/2	180	15	10	ELEC.	-	BLDG 8
N/A	1	N/A	180	10	10	N/A	-	BLDG. 8
BUDGET	1	1/2	180	20	10	ELEC.	-	BLDG. 8
YALE	1	1	—	—	10	ELEC	40 FT.	BLDG. 8
HERCULES	1	1	—	—	10	CHAIN HOIST	40 FT	BLDG. 8
YALE	1	1 1/2	—	—	10	ELEC.	40 FT	BLDG. 8
YALE	8	1 1/2	—	—	39	CHAIN HOIST	113 FT.	BOILER ERECTION
YALE	1	1	—	—	25	ELEC.	8 FT.	BLDG. 7
YALE	1	1/2	180	15	10	ELEC	—	BLDG. 7
HANNISCHFEGER	2	1	—	—	12	ELEC.	190 FT.	BLDG. 7
N/A	1	N/A	—	—	12	N/A	20 FT.	BLDG. 7
YALE	1	1	—	—	7	CHAIN HOIST	30 FT.	BLDG. 7
BUDGET	1	1	—	—	15	ELEC.	30 FT.	BLDG. 7
HARRINGTON	2	5	—	—	14	ELEC.	27 FT	LEADSHOP
WRIGHT	1	2	360	10	12	ELEC.	—	LEADSHOP
YALE	1	3	—	—	8	CHAIN HOIST	10 FT.	LEADSHOP
YALE	1	2	—	—	8	CHAIN HOIST	10 FT.	LEADSHOP
YALE	1	1	360	10	10	ELEC.	—	BUILDING DOCK 1
BUDGET	1	1	180	15	10	AIR	—	BLDG. 12
BUDGET	1	2	180	15	15	AIR	—	BLDG. 12
BUDGET	1	1	180	8	10	ELEC.	—	BLDG. 12
BUDGET	1	1	180	10	10	ELEC	—	BLDG. 9
N/A	1	N/A	180	8	8	N/A	-	BLDG. 9
BUDGET	1	1	180	6	8	ELEC.	-	BLDG. 9
WESTERN	1	2	—	—	N/A	RACK & PINION	30 FT	BLDG. 9
PEERLESS	1	2	—	—	N/A	CHAIN HOIST	50 FT.	BLDG. 9
YALE	1	2	—	—	N/A	CHAIN HOIST	50 FT.	BLDG. 9
INGERSOLL RAND	2	2	—	—	N/A	AIR	110 FT.	GALVANIZING SHOP
INGERSOLL RAND	1	2	—	—	N/A	AIR	100 FT.	GALVANIZING SHOP

HOIST	QTY	CAPACITY (TONS)	SWING (DEGREES)	BOOM L (FT)	BOOM H (FT)	POWER SOURCE	MONORAIL TRAVEL	LOCATION
YALE	1	2	180	12	10	ELEC.	—	BLDG. 4
YALE	1	1	180	15	10	ELEC.	—	BLDG 4
YALE	1	1/2	180	15	10	ELEC.	—	BLDG. 4
BUDGET	1	1	180	20	10	ELEC.	—	BLDG 4
YALE	2	1	180	15	10	ELEC.	—	BLDG. 4
YALE	1	1/2	180	15	12	ELEC.	—	BLDG 4
BUDGET	1	1	180	15	10	ELEC.	—	BLDG. 4
BUDGET	2	2	180	20	10	ELEC.	—	BLDG. 4
YALE	1	1/2	180	12	10	ELEC.	—	BLDG 4
YALE	1	1/2	180	20	10	ELEC.	—	BLDG. 4
BUDGET	1	2	180	15	10	ELEC.	—	BLDG 4
BUDGET	3	2	180	12	10	ELEC.	—	BLDG 4
BUDGET	4	1	180	15	10	ELEC.	—	BLDG. 4
YALE	4	1/2	180	15	10	ELEC.	—	BLDG. 4
BUDGET	1	1	—	—	10	ELEC	160 FT.	BLDG. 4
YALE	1	1	180	12	10	CHAIN HOIST	—	BLDG. 4
N/A	1	N/A	180	20	15	N/A	—	TEE WELDER AREA
INGERSOLL RAND	1	2	180	20	15	AIR	—	BLDG. 2 - R SHEAR
BUDGET	1	1	—	—	10	ELEC.	115 FT.	BLDG 2 - R SHEAR
WRIGHT	1	2	—	—	10	CHAIN HOIST	30 FT	BLDG 2
N/A	1	N/A		-	10	N/A	30 FT	BLDG 2
INGERSOLL RAND	3	2	180	25	15	AIR	-	BLDG 2 - ENGLISH, C-PRESS
INGERSOLL RAND	2	2	180	22	12	AIR	-	BLDG 2
YALE	1	2	180	22	12	ELEC.	—	PLATE SHOP WEB FRAME PLATEN
YALE	2	2	180	22	15	AIR	—	PLATE SHOP WEB FRAME PLATEN
INGERSOLL RAND	3	2	180	22	15	AIR	—	PLATE SHOP WEB FRAME PLATEN
N/A	2	N/A	180	22	15	N/A	—	PLATE SHOP WEB FRAME PLATEN
INGERSOLL RAND	1	2	180	20	15	AIR	—	PLATE SHOP WEB FRAME PLATEN
INGERSOLL RAND	1	3	180	20	15	AIR	—	BLDG 2 - ANGLE SHEAR
BUDGET	1	2	180	15	10	AIR	-	BLDG. 2 -
BUDGET	2	1	—	—	15	ELEC.	110 FT.	BLDG 2 -

BY: J.R RUECKER
F & L E. DEPT.

LIFT TRUCKS

AUG 1980

NASSCO NO	MAKE	MODEL	DESCRIPTION PROP.	XMSN	TIRES	CAP X1000	LIFT HT & STAGE	LICENSED YES	LICENSED NO	ASSIGNED TO	AGE	CARD
03-680	CLARK	C 60 Q	GAS	AUTO.	CUSH.	6	123		X	MACHINE SHOP	4	F
03-795	CLARK	C300-Y90	DIESEL	AUTO.	CUSH.	4	127		X	MACHINE SHOP	3	G
14-84	CLARK	C 40 B	GAS	AUTO.	CUSH.	4	—		X	BOILER SHOP	18	P
19-14	CLARK	CHY200D	DIESEL	OIL EL.	PNEU	20	2-SPD 210	X		TRANSPORTATION	10	P
19-15	CLARK	CHY200D	DIESEL	OIL EL.	PNEU	20	2-SPD 210	X			10	P
19-20	J.R.KINNEY	S210	GAS	AUTO.	PNEU	4	MULTI-PALLET CARRIER		X		5	F
19-80	ROSS	7B6B	GAS	MAN.	PNEU.	30	CLAMP CARRIER		X		3	G
19-140	A-C	S270	DIESEL	AUTO.	PNEU.	26	SIDE LOADER		X		6	F
19-231	CLARK	CHY 300	DIESEL	OIL EL.	PNEU.	30	2-SPD 210	X			14	P
19-232	CLARK	SC400B	DIESEL	AUTO.	PNEU.	40	LOADING CRANE	X			4	G
19-266	CLARK	CS00YS25D	DIESEL	AUTO.	PNEU.	20	144		X		1	G
19-267	CLARK	CS00YS25D	DIESEL	AUTO	PNEU.	20	144		X		1	G
19-268	CLARK	CS00YB0D	DIESEL	AUTO.	PNEU.	8	147		X		1	G
19-269	CLARK	CS00YS80	DIESEL	AUTO	PNEU	8	123		X		1	G
19-270	CLARK	CS00YS80	DIESEL	AUTO	PNEU	8	123		X		1	G
19-271	CLARK	CS00YS80	DIESEL	AUTO	PNEU	8	123		X		2	G
19-272	CLARK	CS00YS25D	DIESEL	AUTO	PNEU.	22.5	144		X		2	G
19-273	CLARK	CS00 YB0	GAS	AUTO	GRIE.	8	147		X		5	F
19-274	CLARK	CS00-Y60	GAS	AUTO	GRIE.	6	123		X		5	F
19-275	CLARK	CS00-Y80	GAS	AUTO	GRIE.	8	147		X	CARPENTER SHOP	5	F
19-276	CLARK	CS00 H80D	DIESEL	OIL EL.	PNEU	20	2-SPD 210	X		TRANSPORTATION	5	F
19-280	CLARK	CS00YS0D	DIESEL	AUTO	PNEU	30	2-SPD 210	X			4	G
19-281	CLARK	CS00-130D	DIESEL	AUTO.	GRIE.	13	173	X			4	G
19-282	CLARK	CS00-130D	DIESEL	AUTO	GRIE.	13	173	X			4	G
19-285	TOYOTA	02-FD-30	DIESEL	AUTO	GRIE.	6	157		X		2	G
19-300	CLARK	BO 6.0	GAS	MAN	PNEU	40	CLAMP CARRIER	X			6	F
19-308	CLARK	CS00 YS60	GAS	AUTO	GRIE	6	151		X		4	F
19-309	CLARK	CS00-YS60	GAS	AUTO	GRIE	6	151	X			4	F
19-450	CLARK	300-40	GAS	MAN.	PNEU.	40	STRADDLE CARRIER	X			9	P
19-477	CLARK	CS00-YS0D	DIESEL	AUTO	GRIE.	15	173	X			4	G
19-681	CLARK	CS00 YS60	GAS	AUTO	GRIE	6	148	X			4	G
19-682	CLARK	CS00-YS60	GAS	AUTO	GRIE.	6	130	X			4	G
19-683	CLARK	CS00-YB0	GAS	AUTO	GRIE	8	147	X			4	G
19-684	CLARK	CS00-YB0	GAS	AUTO	GRIE	8	147	X			4	G
19-685	CLARK	CS00 Y60	GAS	AUTO	GRIE.	8	147	X			4	G
19-686	CLARK	CS00-YS60	GAS	AUTO	GRIE.	8	147	X			4	G
19-688	CLARK	CS00 YB0D	DIESEL	AUTO	GRIE	8	147	X			4	G

NASSCO NO.	MAKE	MODEL	DESCRIPTION PROP.	XMSN	TIRES	CAP X1000	LIFT HT & STAGE	LICENSED YES	LICENSED NO	ASSIGNED TO	AGE	CARD
19-692	CLARK	CS00 YS60	DIESEL	AUTO	GRIE	15	170	X		TRANSPORTATION	3	G
19-696	CLARK	CS00-YS60	DIESEL	AUTO	GRIE	15	170		X		3	G
19-792	CLARK	CS00-YB0D	DIESEL	AUTO	GRIE	8	147		X		3	G
19-793	CLARK	CS00-YB0D	DIESEL	AUTO	GRIE.	8	147		X		3	G
19-794	CLARK	CS00 YS60	GAS	AUTO	GRIE.	6	123		X		3	G
19-796	CLARK	CS00 S60	GAS	AUTO.	GRIE.	6	3-STG 181		X	PLATE SHOP	3	G
19-797	CLARK	CS00-YB0	GAS	AUTO	GRIE.	8	154	X		PIPE SHOP	3	G
19-798	CLARK	CS00 YB60	GAS	AUTO	GRIE	8	148		X	TRANSPORTATION	3	G
19-799	CLARK	CS00 YB0D	DIESEL	AUTO	GRIE.	8	147		X		3	G
19-825	CLARK	CS00-Y80	GAS	AUTO.	GRIE.	8	154		X		3	G
19-826	CLARK	CS00-YS0D	DIESEL	AUTO.	GRIE.	6	123		X		3	G
19-827	CLARK	CS00-YS60	GAS	AUTO.	GRIE.	6	123		X		3	G
19-828	CAT	V80C	GAS	AUTO	GRIE.	8	146		X		2	G
40-80	CLARK	C50B	GAS	AUTO.	CUSH.	5	—		X	CARPENTER SHOP	18	P
49-191	CLARK	CS00-80	GAS	AUTO	CUSH	4	140		X	SHEET METAL SHOP	3	G
53-152	TOWMOTOR	740B	LPG	AUTO.	CUSH.	4	156		X	WAREHOUSE	6	F
53-206	CAT	V60C	GAS	AUTO	GRIE	6	TWO STAGE 130		X		4	G
55-69	HYSTER	H60B	GAS	MAN.	PNEU	6	118		X	WAREHOUSE - P/S	21	P
55-129	TOWMOTOR	V60B	LPG	AUTO.	PNEU.	6	156		X	WAREHOUSE	6	F
55-212	CLARK	NP300-30	ELECT	SCR	SOLID	3	NARROW AISLE		X		1	G
55-213	CLARK	NP300-30	ELECT	SCR	SOLID	3	NARROW AISLE		X		1	G
55-214	CLARK	NSP30	ELECT	N/A	SOLID	3	170		X		7	F
55-215	CLARK	NSP30	ELECT	N/A	SOLID	3	170		X		7	F
55-216	CLARK	NP300-30	ELECT	SCR	SOLID	3	185		X		2	G
55-256	CLARK	IT 60 NB	GAS	AUTO	PNEU	6	181		X		6	F
55-258	CROWN	305 PC	ELECT.	N/A	SOLID	3	196		X		6	F
55-274	CAT	T50B	LPG	AUTO	CUSH	5	156		X		2	G
55-301	CAT	V60C	GAS	AUTO	GRIE.	6	154		X		2	G
55-304	CLARK	NP300 Y54P	ELECT.	N/A	SOLID	4.5	3-STG 243		X		5	F
62-687	CLARK	CS00-Y5	GAS	AUTO.	CUSH	4.5	3-STG 189		X	MAINTENANCE	4	G
R-435	CLARK	CS00YB60D	DIESEL	AUTO	GRIE.	6	154		X	AD LEAD SHOP	4	G
10214	CLARK	CY40B	GAS	AUTO	PNEU	4	—		X	WAREHOUSE	14	P
10629	TOWMOTOR	V60B	LPG	AUTO	PNEU	6	156		X		6	F
10676	CLARK	C60	GAS	AUTO	CUSH	6	154		X	FOUNDRY	7	F
10867	CLARK	NSP 20SG	ELECT.	N/A	SOLID	3	152		X	WAREHOUSE	11	P

BY J.R RUECKER
F.I.E. DEPT.

EQUIPMENT - PLATE SHOP BLDG. 2

AUG. 1980

REF. NO.	NASSCO NO.	DESCRIPTION	AGE	COND	MFG.	MODEL	CAPACITY
1	1709	GRINDER	10	G	N/A	PEDESTAL	2-WHEELS
							USED FOR TOOLS
2	1710	GRINDER	10	G	MARSCHIRE	PEDESTAL	2-WHEELS
							USED FOR PRODUCTION
3	529	PLATE ROLL	8	G	BERTSCH	10080	CAP. 1" X 10' PLATE
4	594	PRESS BRAKE	12	F	CLEVELAND	RH-16-20	1000 TON
							MAX. OUTSIDE DIE 21'-0"
							MAX. INSIDE DIE 20-3"
							CENTER OF DIE TO ARCH 25"
							90° BEND
							THK / DIE OPENING / LENGTH
							5/8" / 5" / 20'-0
							3/4" / 7" / 18'-0
							7/8" / 8 / 16'-0
							1" / 10" / 14'-0
							1 1/8" / 11" / 12'-0
							1 1/4" / 12" / 10'-0
5	573	PLATE ROLL	10	P	NILES	N/A	1/2" X 30'
							TOP ROLL OD 16"
6	579	LARGE FURNACE	20	P	NASSCO	N/A	DIM. 12'-0 WIDE, 30'-0 LONG
							5'-6" HIGH AT ENDS
							UP TO 2200°F
7	580	SMALL FURNACE		F	NASSCO	N/A	DIM. 12" WIDE, 21'-0 LONG
							30" HIGH.
8	563	BANDSAW	12	G	E.B.Y.	N/A	TABLE 38"X56" 35" ARM
							REACH, 13" HEIGHT CLEARANCE
9	N/A	PORTABLE FURNICE	12	G	NASSCO	NN	2' X 2' X 6'
10	533	THREADER	10	F	LANDIS	N/A	TYPE LEAD SCREW,
							CAP 2" DIA.
11	571	DRILL PRESS	12	F	WALKER-TURNER	N/A	ARM REACH 7 1/2", SPINDLE
							TO BASE 12", PRODUCTION
							TABLE 16"X16" SPINDLE
							TAPER

REF. NO.	NASSCO NO.	DESCRIPTION	AGE	COND	MFG.	MODEL	CAPACITY
12	N/A	TABLE SAW	1	E	ROCKWELL	34-644	MAX. DEPTH OF CUT 3 1/8"
							MAX. RIP TO RIGHT OF BLADE 50"
							MAX. RIP TO LEFT OF BLADE 15 1/2"
							MAX TILT OF CUT @ 45° 2 1/8"
							DIST FRONT OF TABLE TO CENTER
							OF BLADE 11 13/16"
							TABLE IN FRONT OF SAW BLADE
							AT MAX. CUT 11 7/8"
							MAX. WIDTH OF DADO 13/16"
13	N/A	ROTATORY BURNING TABLE		G	N/A	N/A	12" DIA TABLE
							AIR POWERED
14	1712	GRINDER	10	G	N/A	PEDESTAL	2-WHEELS
							USED FOR TOOLS
15	1015	RADIAL DRILL	6	F	SUMMIT	M90-L4	36" SIZE
16	1628	THREADER		G	OSTER	792-A	1/4" TO 2" DIA
17	508	DROP HAMMER		G	BEMENT MILES	N/A	CAP. 12", 18 THROAT
							600 #
18	N/A	SMALL FURNACE	10	G	NASSCO	N/A	4" X 18" X 18"
19	1711	GRINDER	10	G	N/A	PEDESTAL	2-WHEELS
							USED FOR TOOLS
20	510	HYDRAULIC PRESS		F	N/A	1161	12" STROKE, 2000 PSI,
							5 TONS, 85" LONG OPENING
21	525	PLATE ROLL		F	MILES/JONES	3	CAP. 1/2" X 10'
							TOP ROLL 11" & BOT. 9"
22	N/A	DRILL PRESS		F	ERICE		0-1/2" JACOBS CHUCK
23	N/A	BAND SAW	13	F	SEARS	12"	ARM REACH 12", HEIGHT
							CLEARANCE 6", TABLE
							24" X 30"
24	10110	BULL DOZER	15	G	CLEVELAND	2	200 TONS 24" I BEAM
							HORIZONTAL & VERTICAL,
							1 3/4" SLIDE STROKE, 12" ADJ. STRK
							28 STROKES PER MIN.

BY: J.R. RUECKER
F. & I.E. DEPT.

EQUIPMENT - PLATE SHOP BLDG 2

AUG. 1980

REF NO	NASSCO NO	DESCRIPTION	AGE	COND	MFG.	MODEL	CAPACITY
25	515	"C" PRESS	20	G	BEATY	N/A	350 TONS, 6' THROAT,
							2'X5' T SLOT BED, 3'-6"
							CLEARANCE, 36" STROKE
26	520	COMBO. SHEAR,	30	F	KLING	7	SHEAR
		PUNCH & COPER					PLATE UP TO 3/4"
							FLAT BAR UP TO 1"X7"
							SQUARE BAR UP TO 2"
							ROUND BAR UP TO 2 3/4"
							ANGLE-SQ. UP TO 6"X6"X 1/2"
							ANGLE-MITER UP TO 4"X4"X 1/2"
							TEES - SQ. UP TO 4"X4"X 1/2"
							PUNCH
							MAX. 1 3/16" HOLE THRU 1" PLATE
							COPER
							I BEAM UPTO 12"
							CHANNELS UP TO 12"
							ANGLES UP TO 4"X4"X1/2"
							PLATES UP TO 1/2"
27	518	BEAM PUNCH	50	F	CLEVELAND	EF 30	36" THROAT, 30 STROKES/MIN
		PRESS					PUNCH 1 1/4" THRU 1"
							PLATE SHEAR 1/8"
							BAR SHEAR 6"X1"
							ROUND BAR SHEAR 2"
							SQ BAR SHEAR 1 1/4"
							ANGLE SHEAR 4"X4"X 1/2"
28	1046	PLATE SHEAR	30	F	STAMCO	N/A	MAX. 3/4" X 10' MILD STEEL
29	521	ANGLE SHEAR	1	G			:
							MAX 8"X 8"X 3/4"
30	524	BAND SAW		P	MARVEL	0	TABLE 30"X 50"
							ARM REACH 18" HEIGHT
							CLEARANCE 18" FEED ROLLS
							TO & FROM SAW
31	N/A	ABRASIVE SAW		P	HERCURY	N/A	MAX. 2 1/2"
32	10372	PLATE ROLL	30	F	SMITH	A10	MILD STEEL PLATES ONLY
							38' LONG OPERATING
							2" R - 9' RAD 38' LONG
							1 1/2" R - 5' RAD 38' LONG
							1 1/4" R - 4' RAD 38' LONG

BY: J.R. RUECKER
F. & E. DEPT.

PLATE SHOP BLDG. 2
EQUIPMENT LOCATIONS

JUNE 1979
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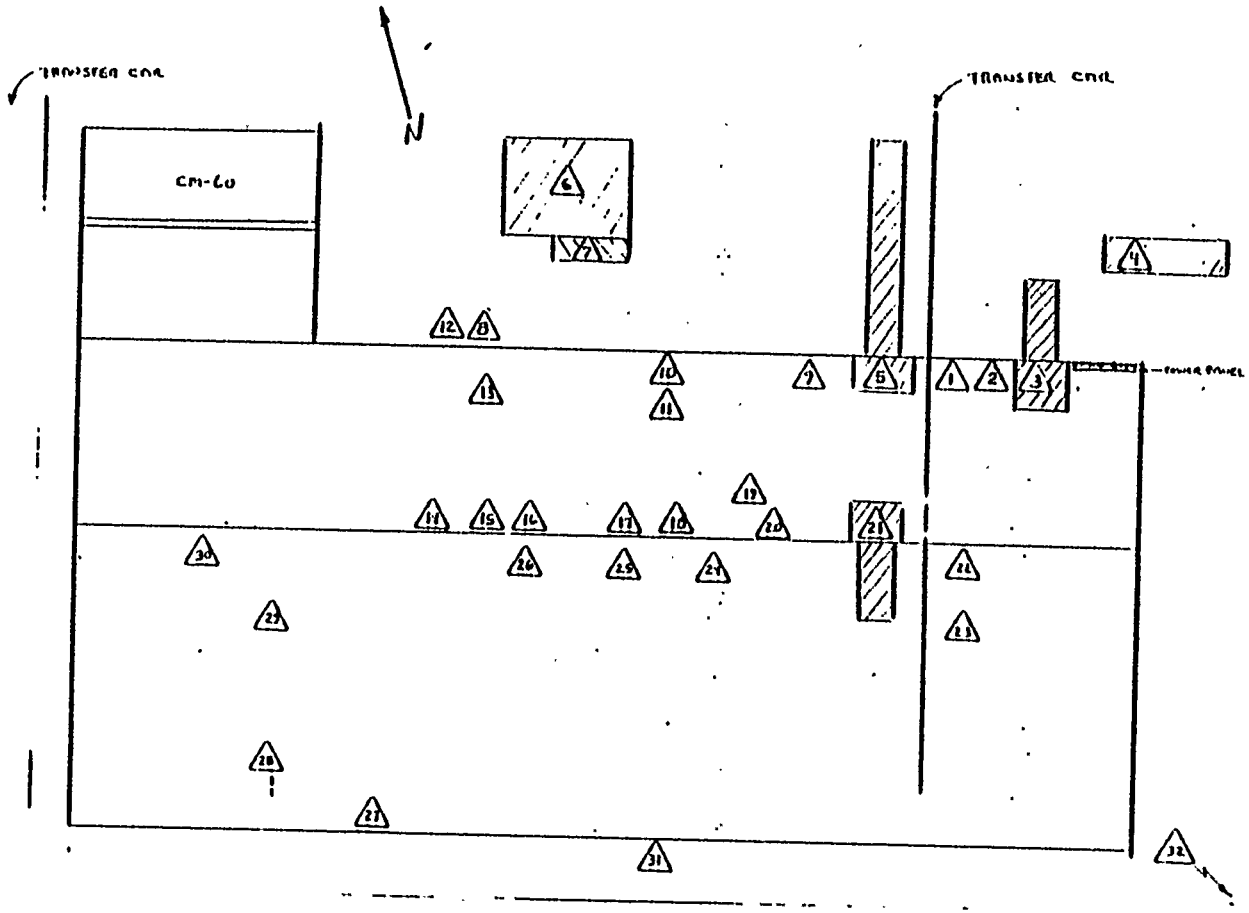

EQUIPMENT – GALVANIZING BLDG. 3

AUG. 1980

REF. NO.	NASSCO NO.	DESCRIPTION	AGE	CODE	MFG	MODEL	CAPACITY
1	1303	GALVANIZING	4	F	NASSCO	N/A	TANK SIZE
		TANK					13' LONG
							3'6" WIDE
							4' DEEP
2	1304	SULPHURIC ACID	1	G	NASSCO	N/A	TANK SIZE
		TANK					18' LONG
							4' WIDE
							5' DEEP
3	1305	CAUSTIC SODA	20	G	NASSCO	N/A	TANK SIZE
		TANK					22' LONG
							3' WIDE
							N/A DEEP
4	1313	RINSE TANK	20	G	NASSCO	N/A	TANK SIZE
							10' LONG
							4' WIDE
							5' DEEP
5	1311	EARTH CHLORIDE	10	F	NASSCO	N/A	TANK SIZE
		TANK					16' LONG
							4' WIDE
							N/A DEEP
6	1309	SPINNER	30	G	BARRETT	N/A	150 LB CAP.
							24" DIA. TOP OPENING
7	1310	SANDBLAST	30	G	SLY.	N/A	SIZE 10' X 10' X 8'
		HUT					
8	1315	SCALE	30	F	HOWE	N/A	6 TONS

BY: J.R RUECKER
F. & I. F DEPT.

EQUIPMENT PIPE SHOP BLDG 4

AUG. 1980

REF. NO	NASSCO NO	DESCRIPTION	MFG.	MODEL	CAPACITY
1	10934	GASKET CUTTER	HYDRONIC	SER. 50	MATERIAL - UP TO 3/8" THK
					GASKET MTL
					TABLE - 36" X 36"
2	242	HAND PRESS	ATLAS	NO. 2	ARM REACH - 5"
					FACE TO BASE - 13"
3	1705	GRINDER	N/A	BENCH	2 - 10" WHEELS
4	234	DRILL PRESS	BUFFALO	NO 16	CHUCK - MORSE TAPER
					TABLE - 15" X 16"
					ARM REACH - 8"
					FACE TO BASE - 10"
5	106	THREADER	N/A	N/A	PORTABLE
					1/8" TO 2" DIA.
6	109	THREADER	N/A	N/A	PORTABLE - TO BE SCRAPED
					1/8" TO 2"
7	N/A	PIPE & BOLT THREADER	OSTER	655	PORTABLE - TO REMAIN #104
					1/8 TO 2" DIA.
8	259	DRILL PRESS	C.H. BULOTTI	FLOOR	CHUCK - MORSE TAPER
					TABLE - 18" DIA.
					ARM REACH - 11"
					FACE TO BASE - 30"
9	105	THREADER	OSTER	718	STATIONARY
					1" TO 6" DIA
10	246	BANDSAW	JOHNSON	N/A	MTL THK. 0 TO 4"
11	253	PANTOGRAPH	N/A	N/A	3" TO 8" DIA.
					30° & BEVEL CUTS
					TORCH - LINDE C-61 NAT. GAS
12*	N/A	PANTOGRAPH	VERNON TOOL	N/A	4 TO 36 DIA
					90°, BEV, SADDLES & HOLE CUTS
					TORCH - THERMAL ARC PCH-6B
					POWER SUPPLY - THERMAL ARC PM 41
					HOLE CUTTING ATTACHMENT
13	235	POWER ROLL	READCO	IRR KI	6" TO 36" DIA
		IDLER ROLL		UTP-1BT	
14	236	IDLER ROLL	READCO	UTP-10T	6" TO 36" DIA.
15	237	IDLER ROLL	READCO	UTP-10T	6" TO 36" DIA.
16	10925	WELDING POSITIONER	RANSOME	N/A	2½" TO 36" DIA.

REF NO	NASSCO NO.	DESCRIPTION	MFG.	MODEL	CAPACITY
17	10930	BANDSAW	MARVEL	NO 8	TABLE 33" X 40"
					FEED TABLE 18" X 9' W/ROLLERS
					ARM REACH 18"
					FACE TO BASE - 18"
18	1702	GRINDER	N/A	PEDESTAL	2 - 10" WHEELS
19	1701	DISK SANDER	NASSCO	N/A	24" DIA
					TABLE 13" X 35"
20	N/A	HYDRAULIC PRESS	NUCIER	H-1	OPENING - 10"H, 30"W
21*	10957	PIPE BENDER	COAST	N/A	4" TO 12" DIA
					CU, CU-NI RAD. 3 X DIA.
					STL RAD. 5 X DIA.
22	1701	GRINDER	N/A	PEDESTAL	2" - 10" WHEELS
23	10927	WELDING POSITIONER	ARONSON	HDE250-4	2½" TO 36" DIA
24	N/A	WELDER	JETLINE	N/A	SEAM WELDS
					I.D. 10" TO 48" DIA 6'L X 2 - 12" LONG
					O.D. 2" TO 48 DIA 10" LONG
					JOINT WELDS
					UP TO 48" DIA
25	10926	WELDING POSITIONER	ARONSON	HDE250-4	2½" TO 36" DIA
26	10928				
27	1700	GRINDER	N/A	PEDESTAL	2 - 8" WHEELS
28	10932	WELDING POSITIONER	ARONSON	HDE250-4	2½" TO 36" DIA.
29	10929				
30	10931				
31	10935	EXPANDER	N/A	N/A	2½ TO 12 DIA
					NON-FERROUS HAND-WHEEL & SCREW
32*	10888	BANDSAW	MARVEL	NO 8	TABLE 33" X 40"
					FEED TABLE 18" X 9' W/ROLLERS
					ARM REACH - 18"
					FACE TO BASE - 18"
33	10930	WELDING POSITIONER	ARONSON	HDE250-4	2½" TO 10" DIA
34	10027	HOSE ASSEMBLER	NASSCO	N/A	3" TO 6" DIA. HOSE
35	107	HOSE ASSEMBLER	AEROQUIP	B	1/8" TO 2" DIA. HOSE
					PORTABLE
36	10956	HOSE CUTTER, STRIPPER	N/A	N/A	1/8" TO 2" DIA HOSE

* THIS EQUIPMENT WILL BE MOVED TO THE NEW PIPE SHOP IN X II

BY J.P. ROECKER
1 of 1 pg

EQUIPMENT PIPE SHOP BLDG 4

AUG 1980

REF. NO.	TRACTOR NO.	DESCRIPTION	MFG.	MODEL	CAPACITY	AGE	COND
37	10933	WELDING POSITIONER	PANDUIT	15-4	2½" TO 8" DIA.	2	E
38	155	PIPE BENDER	COAST	6 R-D	2½" TO 6" DIA.	1	E
39	1703	GRINDER	STANLEY	N/A	2" TO 10" WHEELS	10	E

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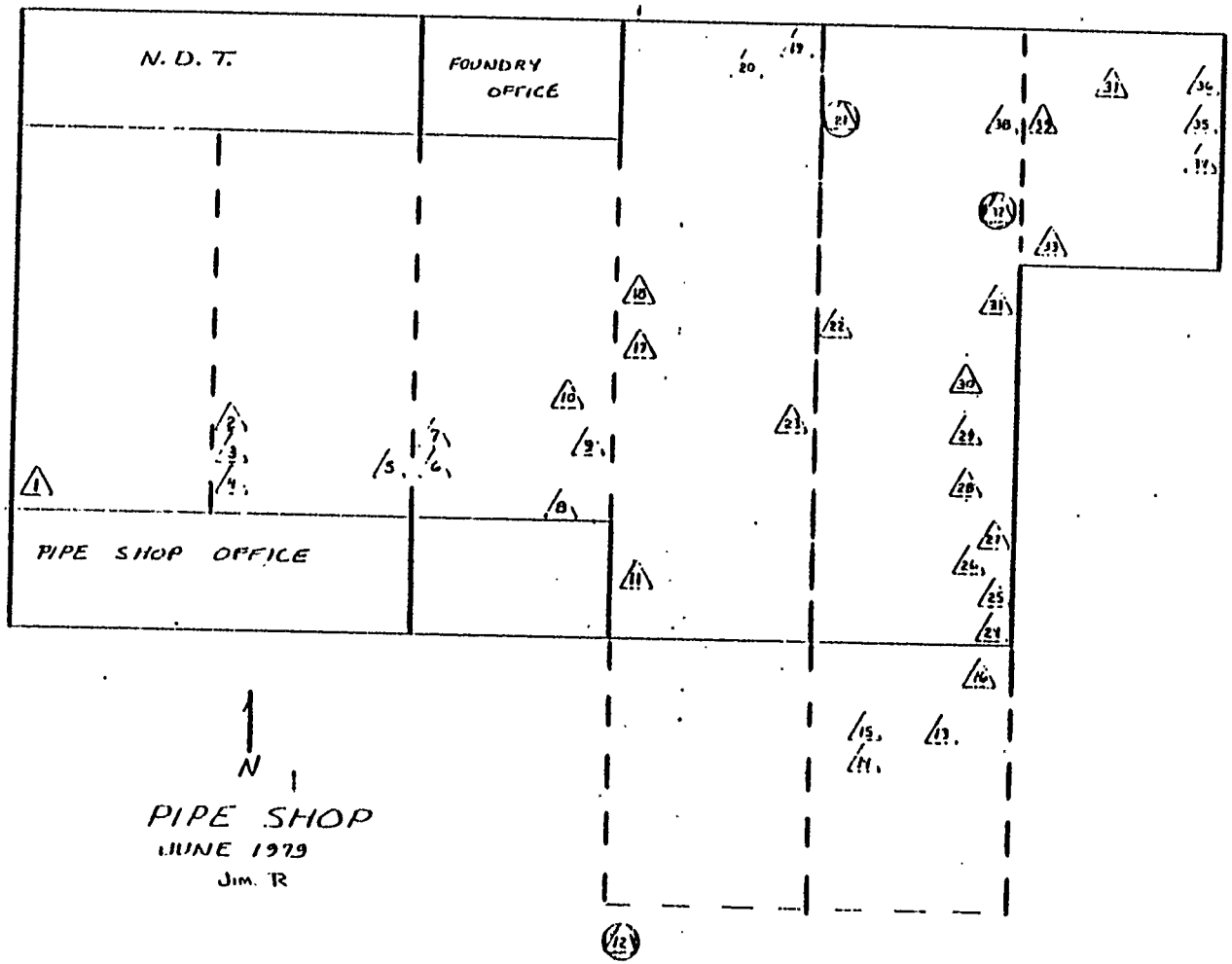
N. D. T.
FOUNDRY OFFICE
PIPE SHOP OFFICE
N
PIPE SHOP
JUNE 1979
Jim. R

EQUIPMENT PIPE ANNEX 1

AUG 1980

REF. NO	NASSCO NO.	DESCRIPTION	MFG.	MODEL	CAPACITY	QTY	LOCATION
1	10325	BENDER	WALLACE	500-25	½" TO 2" DIA.	1	F
					CU, CU-NI RAD 3X DIA		
2	10322	BENDER	NASSCO	N/A	½" TO 2" DIA.	10	F
					CU, CU-NI RAD. 3X DIA.		
3	10323	BENDER	NASSCO	N/A	UP TO 2" DIA.	25	F
					STL. RAD. 5X DIA.		
4	10324	BENDER	NASSCO	N/A	UP TO 1½" DIA.	30	F
					STL RAD. 5X DIA.		
5	10326	BENDER	NASSCO	N/A	½ TO 1¼ DIA.	30	F
					STL RAD. 5 X DIA.		
					ROLL RADIUS BENDS OF		
					PIPE UP TO 2" WITH		
					11" TO 20' RAD.		
6	N/A	BENDER	NASSCO	N/A	1¼" TO 2" DIA.	30	P
					STL. RAD. 5X DIA.		
7	241	BAND SAW	KALAMAZOO	B-C-W	UP TO 2" DIA.	25	F
8	250	COIL BENDER	OSTER	B-RAP	1½" COILS	30	F
					STRAIGHT & TAPERED		
9	1133	GRINDER	N/A	PEDESTAL	2 - 12" WHEELS	15	G
10	1136	THREADER	RIDGID	535	½" TO 2" DIA.	8	F
11	10328	HAND SHEAR	BEVERLY	SS 2	1¼" FLAT BAR		
12	10327	BAND SAW	WELLS	50B	UP TO 2" DIA	5	G
					NON-FERROUS METALS		
13	10338	PIPE BUTTER	OSTER	#10	DEBURRS & BUFFS I.D.		
					¼" TO 4" DIA.		
14	10317	EXPANDER	N/A	N/A	½" TO 2" DIA.	10	F
					NON-FERROUS METALS		
15	10335	BENDER	N/A	N/A	½" TO 2" DIA	10	F
					STL RAD. 5X DIA.		
					PORTABLE		
16	10334	PIPE BENDER	N/A	5"	2½ TO 5 DIA.	15	F
					CU CU-NI RAD 3X DIA		
					STL RAD 5X DIA.		

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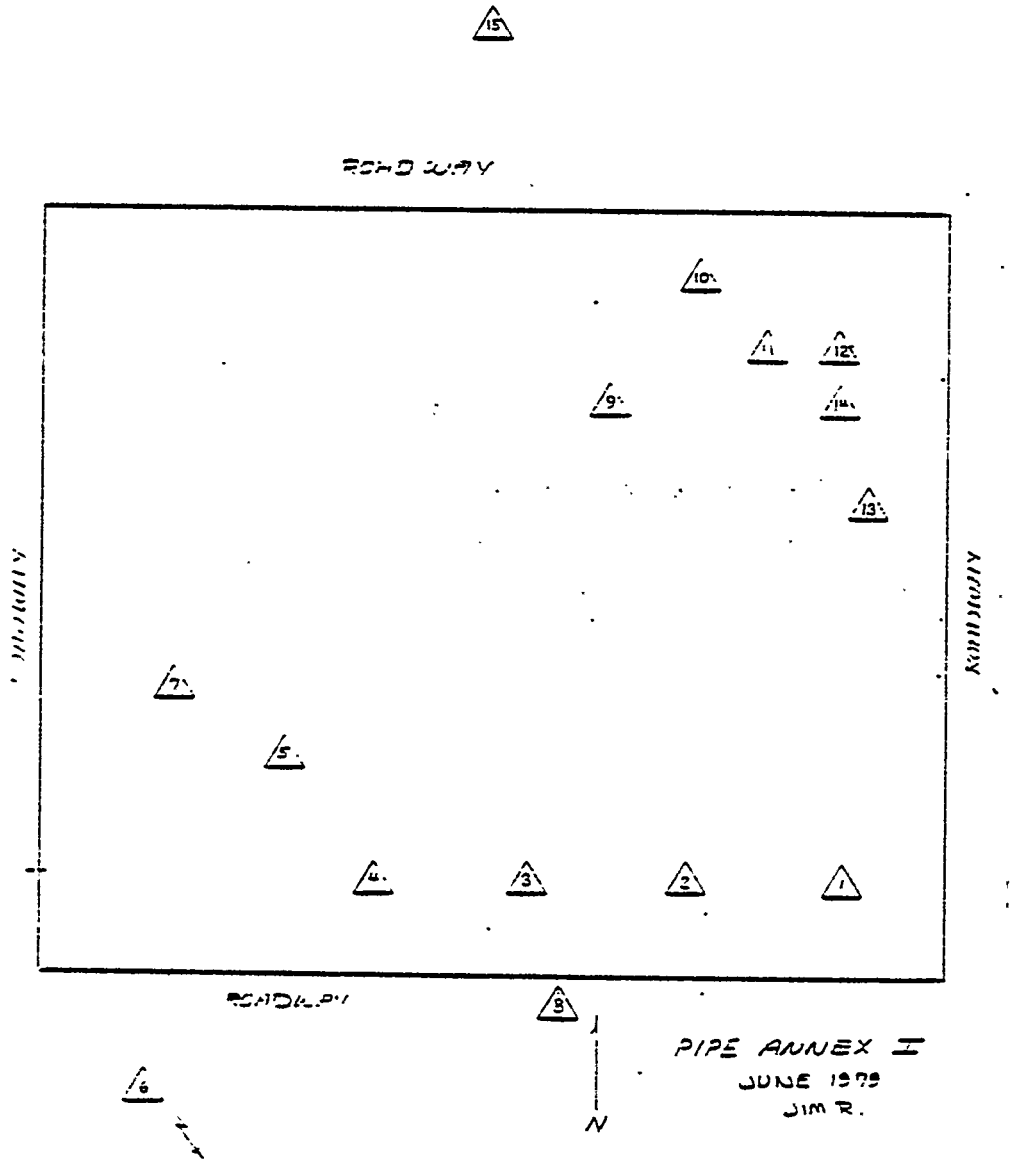
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ROADWAY
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N
PIPE ANNEX I
JUNE 1979
JIM R.

EQUIPMENT - ELECTRIC SHOP BLDG. 6 & 7

AUG. 1980

REF. NO	NASSCO NO.	DESCRIPTION	AGE	COND	MFG.	MODEL	CAPACITY
1	2261	BAKING OVEN	16	P	NASSCO	N/A	23" X 15" X 15"
2	2264	BAKING OVEN	16	P	NASSCO	N/A	64" X 88" X 74"
3	10319	DRILL PRESS	15	F	ROCKWELL	1150-23	7½" THROAT, 36" HEIGHT CLEARANCE, JACOBS CHUCK
4	10316	DRILL PRESS	16	P	WALKER	BDX-A	7½" THROAT, 15" HEIGHT CLEARANCE, JACOBS CHUCK
5	1319	GRINDER	16	F	STANLEY	257	2-WHEELS USED FOR TOOLS
6	N/A	POWER HACK SAW	16	P	WELLS	58B	MAX DIA. 3½"
7	10880	TAG LETTER MACH.	12	P	N/A	T-10A	3/4 LETTERS ALPHA & NUMERIC
8	298	TEST BOX RHEOSTAT	16	F	NASSCO	SMALL	TYPE SALT WATER TANK FOR TESTING GENERATORS
9	299	TEST BOX RHEOSTAT	15	G	NASSCO	LARGE	TYPE SALT WATER TANK FOR TESTING GENERATORS
10	N/A	TEST BOX RHEOSTAT	15	G	NASSCO	LARGE	TYPE SALT WATER TANK FOR TESTING GENERATORS
11	N/A	BAKING OVEN	12	F	N/A	N/A	8'H X 10'L X 8'W
12	N/A	DIP TANK	1	E	NASSCO	N/A	FLOOR PIT 8'D X 6'L X 6'W
13	N/A	DIP TANK	1	E	NASSCO	N/A	FLOOR PIT 8'D X 8'L X 6'W
14	N/A	DIP TANK			NASSCO	N/A	3' X 3' X 2'
15	N/A	DIP TANK			NASSCO	N/A	3' X 7' X 3'
16	N/A	DRILL PRESS	16	P	ROCKWELL	1150 A	7½" THROAT, 36" HEIGHT CLEARANCE, JACOBS CHUCK
17	N/A	POWER HACK SAW	12	F	WELLS	58B	MAX. DIA. 3½"
18	N/A	DRILL PRESS			DAYTON	32326	7½" THROAT, 36" HEIGHT CLEARANCE, JACOBS CHUCK
19	N/A	GRINDER	10	F	ROCKWELL	438	2-WHEELS USED FOR TOOLS
20	N/A	PUNCH			GREENLEE	1731	MAX. MTL THK 1/8" STEEL, MAX. DIA. 1"
21	N/A	BELT & DISC SANDER			SEARS	N/A	7" DIA. DISC 6" WIDE BELT
22	N/A	ALLIGATOR HACK SAW			WELLS	58B	MAX. DIA 3½"

BY: J.R RUECKER
F/I E. DEPT.

EQUIPMENT - SHEET METAL SHOP BLDG. 1

AUG 1980

REF NO	VASSCO NO.	DESCRIPTION	AGE	COND	MFG	MODEL	CAPACITY
1	1750	GRINDER	10	G	N/A	PEDESTAL	2-WHEELS
							USED FOR PRODUCTION
2	704	IRON WORKER	15	F	BUFFALO	½ B	PUNCH - 1 1/16" x 5/8" DIA 13/16" x ¾"
							SHEAR - 5/8" x 9", ½" x 8 ½",
							⅜" x 9", ¾" x 7 ⅜" FLATS
							BAR CUTTER 4" x 4" x ½" ∠ SQ
							3" x 3" x 5/16" ∠ 45° MITER, 1½" SQ.
3	720	PUNCH PRESS	15	F	EXCELSIOR	N/A	MAX. ¾" HOLE IN ⅜" PLATE
							TABLE 22" x 36"
4	516	PUNCH	15	F	CLEVELAND	C	MAX. 13/16" HOLE IN ¾" PLATE
							12" THROAT
5	709	DRILL PRESS	10	F	TURNER	BENCH	7½" THROAT, 18" HEIGHT
							CLEARANCE, JACOBS CHUCK
6	710	DRILL PRESS	10	F	TURNER	BENCH	7½" THROAT, 13" HEIGHT
							CLEARANCE, JACOBS CHUCK
7	719	DRILL PRESS	10	F	HOUDAILLE	BENCH	7½" THROAT, 16" HEIGHT
							CLEARANCE, JACOBS CHUCK
8	10093	BAND SAW	10	G	MARVEL	8	TABLE 33" x 40"
							18" THROAT
							18" HEIGHT CLEARANCE
9	712	DRILL PRESS	3	E	Kn KNOELL	EFF-3T	UP TO 2" DIA. HOLE
							18" THROAT, 44" HEIGHT
							CLEARANCE, 20" x 30" T SLOT
							TABLE
10	706	DUPLICATOR	3	E	WHITNEY	635 A	12" THROAT, 30 TONS
							PUNCH DIA. VS. MTL THK
							9/16"ø ½" MTL
							2" ¼"
							3" 3/16"
							5" 10GA.
11	707	PRESS BRAKE	5	E	CINCINNATI	N/A	175 TON
							MAX. STROKE 10"
							12'
12	730	PRESS BRAKE	5	E	BATH	C-3-10	120 TON
							14'

REF NO	VASSCO NO.	DESCRIPTION	AGE	COND	MFG	MODEL	CAPACITY
13	745	SHEAR	10	G	SHIPLEY	0412	MAX PLATE THK ¼"
							14" LONG
14	714	DISK SANDER	5	G	N/A	N/A	12" DIA. DISK
							TABLE 7" x 17"
15	N/A	BAND SAW	10	G	MARVEL	8	TABLE 33" x 40"
							18" THROAT
							18" HEIGHT CLEARANCE
16	734	CUT OFF SAW	8	G	MERCURY	N/A	20" DIA ABRASIVE WHEEL
							CUTS 4" PIPE TO 3"
17	715	ROLL FORMER	10	G	PEXTO	N/A	MAX. THK. ⅛"
							4' LONG
18	10318	ROLL FORMER			PEXTO	118-E	MAX. THK. 1/16"
							4' LONG
19	711	DRILL PRESS	10	G	BUFFALO	N/A	7½" THROAT, 6" HEIGHT
							CLEARANCE, JACOBS CHUCK
20	744	PUNCH &			WHITNEY	16	PORTABLE, HAND OPERATED
		NOTCH					PUNCH - ¾" ø THRU ¼"
							NOTCH - 6" NOTCH THRU 20 GA
21	756	SPOT WELDER	15	F	STRYCO	N/A	16" THROAT
22	741	NIBBLER	20	P	PULLMAX	D3	MAX. THK 3/16"
							48" THROAT
23	754	LOCKFORMER	10	P	LOCKFORMER	N/A	MAX THK 16 GAUGE
		EDGER					FORMS ¼" FLANGES
24	743	LOCKFORMER	10	P	LOCKFORMER	N/A	MAX. THK 20 GAUGE
		PITSBURG					FORMS PITSBURG LOCKS
25	757	FORMER	10	P	PEXTO	1527	MAX THK 16 GAUGE
							FORMS LAP OUT, LAP IN, BEADS
							SHRINKS DIA. & ROLLS EDGES
26	718	PAN BRAKE	15	F	KRUMP	31	HAND OPERATED
							MAX. THK 20 GAUGE
							4' LONG
27	1751	GRINDER	15	G	N/A	PEDESTAL	2-WHEELS
							USED FOR TOOLS
28	764	LEAF BRAKE	15	F	N/A	N/A	HAND OPERATED
							MAX. THK. 16 GAUGE
							6' LONG

BY: J.R RUECKER
F & I E DEPT.

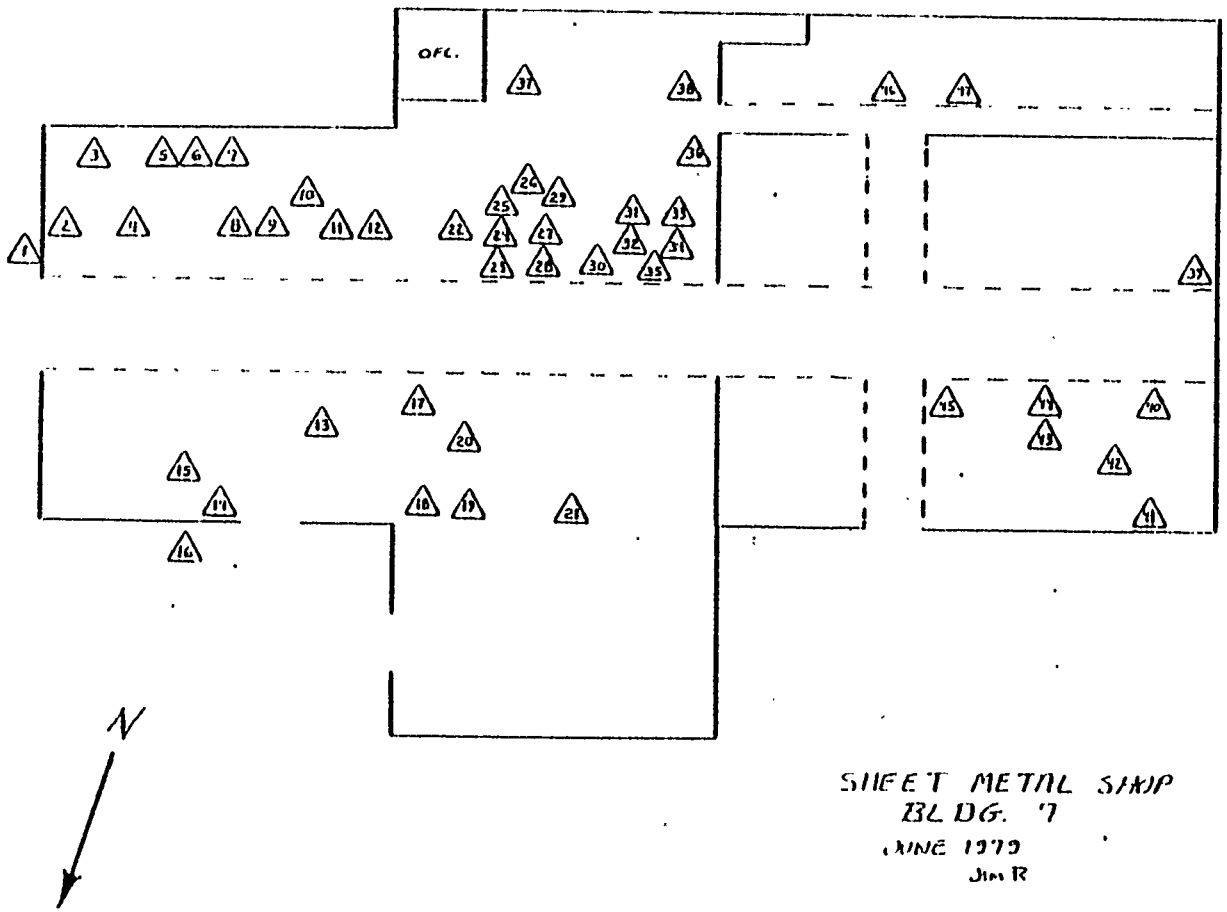
EQUIPMENT- SHEET METAL SHOP BLDG. 1

AUG. 1980

REF. NO.	NASSCO NO.	DESCRIPTION	AGE	CON	MFG.	MODEL	CAPACITY
29	718	LOCKFORMER PITTSBURG	10	F	LOCKFORMER	N/A	MAX. THK 16 GAUGE FORMS PITTSBURG LOCKS
30	741	LEAF BRAKE	15	F	KRUMP	1014	HAND OPERATED MAX. THK 16 GAUGE 8' LONG
31	714	DRILL PRESS	15	F	DELTA	N/A	7½" THROAT, 22" HEIGHT CLEARANCE, JACOBS CHUCK
32	719	HAND PUNCH	15	F	WHITNEY	16	½" DIA. HOLE THRU ¼" THK. MIL
33	721	BOX FOLDER	15	G	PEXTO	N/A	MAX. THK. 22 GAUGE 3' LONG
34	716	LOCKFORMER EDGER	15	F	LOCKFORMER	N/A	HAND OPERATED MAX. THK 22 GAUGE
35	736	ROLL FORMER	15	F	PEXTO	3B1-b	HAND OPERATED MAX. THK. 16 GAUGE 3' LONG., MIN. DIA. 3"
36	745	BAND SAW	15	F	DELTA	N/A	20" THROAT 14" HEIGHT CLEARANCE
37	772	SHEAR	10	G	WYSONG	816	MAX. PLATE THK 16 GA. 8' LONG
38	705	PRESS BRAKE	5	E	DI-ACRO	16-36	35 TON MAX. THK. 16 GAUGE 8' LONG
39	1753	GRINDER	15	F	N/A	N/A	2-WHEELS USED FOR TOOLS
40	1752	GRINDER	15	F	N/A	N/A	2-WHEELS USED FOR PRODUCTION
41	10292	CUT OFF SAW	10	I	BRIDGEPORT	N/A	14" DIA. ABRASIVE WHEEL CUTS SHAPES & MAKES ANGLE CUTS UP TO 45°
42	722	ROD BENDER	15	F	O'NEIL-IRWIN	2 DI-ACRO	MAX. ROD ⅜" DIA WITH A 1" RADIUS
43	750	DRILL PRESS	15	E	ROCKWELL	1150A	7½" THROAT, 36" HEIGHT CLEARANCE, JACOBS CHUCK
44	744	DISK SANDER	15	F	ROCKWELL	N/A	TABLE 7" X 17" 12" DIA. DISK

REF. NO.	NASSCO NO.	DESCRIPTION	AGE	CON	MFG.	MODEL	CAPACITY
45	1071	BAND SAW	15	F	TURNER	SK20301	16" THROAT, 12" HEIGHT CLEARANCE
46	747	BAND SAW	5	G	TURNER	N/A	16" THROAT, 12" HEIGHT CLEARANCE
47	742	LOCKFORMER PITTSBURG	15	F	LOCKFORMER	N/A	MAX. THK 20 GAUGE FORMS PITTSBURG LOCKS AND ¼" FLANGE UP

BY: J. R RUECKER
F & I.F. DEPT.



SHEET METAL SHOP
BLDG. 7
JUNE 1979
Jim R

EQUIPMENT - MACHINE SHOP BLDG. 8

AUG. 1980

REF. NO.	NASSCO NO.	DESCRIPTION / MODEL	CAPACITY: SIZE	SWING	SWING OVER CROSS SLIDE	DIST. BETWEEN CENTERS
		LATHES				
1	1504	LEBLOND	32"	35"	23½"	264"
2	1506		50"	52½"	35½"	420"
3	1507	AMERICAN	32"	43"	32"	170"
4	1508	LODGE & SHIPLEY	N/A	60"	42"	174"
5	1510	AXELSON	32"	31½"	19"	96"
6	1511	MONARCH	36 NN	37½"	20½"	81"
7	1512	33N	25N	33½"	22"	120"
8	1513	JONES & LAMSON TURRET "S	5"	21½"	12¾"	29½"
9	1515	LODGE & SHIPLEY - 2013	20"	20½"	13½"	78"
10	1516	- X	20"	22"	15"	53"
11	1517	AMERICAN PACEMAKER	18"	23"	13"	78"
12	1518	CINCINNATI	18"	18½"	11"	74"
13	1519	LEBLOND	13"	18"	10"	53"
14	1520	- REGAL	N/A	11"	0"	93"
15	1521		N/A	11"	8½"	30"
16	1522	CLAUSING	12"	12"	7"	36"
17	1523		12"	12"	7"	36"
18	1524		10"	10¾"	5¾"	36"
19	1556	LEHMANN HYDRAPROL	36"	37½"	24"	312"
20	1562	ROCKWELL SERIES 35 TU	10"	10½"	6"	24"

REF. NO.	NASSCO NO.	DESCRIPTION / MODEL	CAPACITY: TABLE SIZE	DIST. BETWEEN RAILS	DIST UNDER HEAD	LONG. TRAVEL	TRANSV. TRAVEL	VER. RETRACT. CLEARANCE
1	1503	PLANER - DETRICK & HARVEY	72" X 208"	102"	102"	208"	108"	100"
2	1528	ROCKFORD MACHINE	36" X 90"	34"	34"	90"	30"	42" SIDE
3	1529	ROMBURG PLANER	54" X 198"	48"	37½"	144"	54"	24" OPEN SIDE
1	1502	V.T.L. PLANER - BETTS	12" X 144"	6'-11"	6'	-	-	-
2	1505	- WEBSTER & BENNETT	48"	23½"	-	-	-	-

REF. NO.	NASSCO NO.	DESCRIPTION / MODEL	CAPACITY: TABLE SIZE	VERTL. TRAVEL	LONG. TRAVEL	TRANSVERSE TRAVEL	SPINDLE
		MILL					
1	1530	GORTON VERTICAL	12" X 48"	17½"	26½"	12"	"30 TAPER
2	1531	#3 CINCINNATI VERTICAL	15" X 54"	16"	33½"	15½"	"50 TAPER
3	1532	#1 CINCINNATI VERTICAL	16½" X 70"	16"	41½"	15½"	
4	1537	4KSM KEARNEY & TRECKER VERTICAL	17½" X 64"	18"	41½"	11½"	
5	1538	VAN NORMAN UNIVERSAL 18M	14" X 55"	13½"	30½"	11"	
6	1539	#2 CINCINNATI HORIZ. W/VERT. H.	12" X 54"	16"	28"	9½"	
7	1540	#1 CINCINNATI HORIZ. W/VERT. H.	18" X 71"	20"	71"	11½"	
8	1541	CLAUSING VERT. MILLING	6½" X 26"	10½"	17½"	5"	"2 MT
9	1533	CINCINNATI HORIZ. BORING M.	30" X 72"	60"	48"	48"	"50 TAPER
10	1534		10" X 72"	72"	48"	58"	"5 MT

REF. NO.	NASSCO NO.	DESCRIPTION / MODEL	CAPACITY: SIZE COLUMN	ARM ROUND	FACE SPIN TO BASE	SPINDLE
		DRILL PRESS - BOICE RADIAL NO. 1510				
1	1525		12"	36"	48"	"1 MT
2	1524	CARLTON RADIAL	19"	96"	78"	"4 MT
3	1527	CINCINNATI RADIAL	13"	47½"	60"	"5 MT
4	1535	ROCKWELL RADIAL 15 RD	-	17"	80"	"2 MT
5	1536	ROCKWELL SPINDLE	-	6"	23"	
6	1545	CRAFTSMAN NO. 113-21370	-	11½"	42"	24 GANG
7	1561	ROCKWELL NO 15 CCS	-	11½"	42"	
8	1564	BUFFALO 18"	-	9"	18"	"3 MT
9	1576	CLEVELAND MODEL 33	-	24"	24"	N/A

BY: J.R RUECKER
F. & I.E. DEPT.

EQUIPMENT - MACHINE SHOP BLDG 9

AUG. 1980

REF NO	NASSCO NO.	DESCRIPTION / MODEL	CAPACITY						
			TABLE SIZE	WEST WIND TRAVEL	LONG. TRAVEL	TRANSVERSE TRAVEL	WHEEL SIZE		
1	1501	GRINDER - 16" DIAMOND WD 16 C	7" X 19"	-	-	-	10"	15	C
2	1509	" BALDOR G 16 "T"		-	-	-	7½" X 1" X 10"		
3	1516	" " "		-	-	-	" " "		
4	1517	STERLING	2½" DIA	-	-	-	6"	1	G
5	1518	10" DIAMOND WD 10-C	7" X 19"	-	-	-	10"		
6	1512	HARIG SURFACE GRIND	6" X 18"	11½"	18"	12½"	8"	7	G
7	1550	" " "	" " "	" " "	" " "	" " "	" " "	16	G
8	1551	DIAMOND MODEL 6	-	-	-	-	6" DIAMOND	2	E
9	1552	CINCINNATI # 2	8½" X 36"	-	-	8½"	8"	35	F
10	1553	CINCINNATI # 0	" " "	-	-	" "	" "	35	F
11	1558	BLICK E DECKER	-	-	-	-	7½" X 1" X 10"	1	
12	1563	MILLER DISC BUFFER	-	-	-	-	10"	1	

REF NO	NASSCO NO.	DESCRIPTION / MODEL	CAPACITY						
			SIZE						
1	1567	BAND SAW DO ALL V-16	12" THROAT 9½" HIGH					38	F
2	1566	CUT OFF SAW KALAMAZOO	8" X 12"					30	F
3	1568	" MARVEL	10½"					12	F

REF NO.	NASSCO NO.	DESCRIPTION / MODEL	CAPACITY			
			SIZE	SLIDE TRAVEL		
1	1511	MANDREL PRESS - DRAKE MODEL 3A1	-	-		
2	1512	ROCKWELL HARDNESS TESTER - WILSON - 662	-	-		
3	1513	BURR KING MODEL 562	-	-		
4	1514	DIE FILER KELLER MODEL 1A	-	-		
5	1554	DUST KOP MODEL 1105	-	-		
6	1555	" " "	-	-		
7	1557	MAGNE-TECH MODEL 3511	-	-		
8	1559	MANDREL PRESS - ALLEN NO. 3A1	-	-		
9	1560	100 TON HYD. PRESS - ENERPAC	-	-		
10	1565	BURR KING MODEL 562	-	-		
11	1569	PUNCH PRESS WHITNEY MODEL 1B	1½" DIA	-		
12	1574	TRACER - CADILLAC MODEL A-180-B	-	10"		
13	1577	ELECTRO ARC DISINTENGRATOR 2MSA	-	-		
14	1578	" " " 250	-	-		
15	1579	DISC & BELT SANDER - DOSCH	-	-		
16	1570	MILL - MASTER PORTABLE	-	-		
17	1571	END BALANCER - STEWART WARNER	-	-		
18	1572	BLAST CABINET - TANG BORN	-	-		
19	1573	MILL - MASTER PORTABLE	-	-		
20	1575	GRINDER - KALAMAZOO 200	6" BELT	-		

BY: J.R RUECKER
F & I.E. DEPT.

EQUIPMENT- FOUNDRY BLDG 9

AUG. 1980

REF NO	MASSCO NO.	DESCRIPTION	AGE	COND	MFG	MODEL	CAPACITY
1	349	TUMBLER	30	F	N/A	N/A	65" LONG 30" DIA I.D
2	347	MOLD BUMPER	50	F	SPO	N/A	PORTABLE OPENING 17" HEIGHT HOLDING PLATES 17"X21"
3	347	MOLD BUMPER	50	F	SPO	113 J	PORTABLE OPENING 19" HEIGHT HOLDING PLATES 20"X25"
4	1111	GRINDER	30	F	N/A	N/A	1-WHEEL 24"X3" MOUNTED ON OVERHEAD MONORAIL
5	341	DO ALL SAND	30	G	LEPAIR	2W3L20	35" THROAT, 20" HEIGHT CLEARANCE, 30"X30" TILT TABLE
6	1107	GRINDER	40	G	N/A	INDUSTRIAL	2-WHEELS USED FOR PRODUCTION
7	1106	GRINDER	50	F	N/A	INDUSTRIAL	2-WHEELS USED FOR PRODUCTION
8	358	PANO SAND	20	G	WALKER	NO B	16" THROAT, 8" HEIGHT CLEARANCE, 20"X20" TILT TABLE
9	379	OVEN	30	G	FOUNDRY EQUIP	N/A	3-DRAWERS 2@ 12'W X 4'D X 5'H 1@ 10'W X 4'D X 5'H
10	370	SAND MIXER	40	F	BLYSTONE	N/A	6 CU. FT 40" LONG, 30" DIA.
11	376	BRASS PIT FURNACE	40	I	MASSCO	N/A	MAX. 300 LB. CAP 30" DEEP, 20" DIA.
12	357	CORE DRYING OVEN	50	G	N/A	N/A	14'L X 8'H X 7'W NATURAL GAS.
13	352	SAND MIXER	10	G	BUDNEY	N/A	200 LBS PER MIN.
14	353	SAND TURB.	5	G	SIMPT	ST 1000	500 LBS PER MIN.
15	356	BIN FEED	20	G	BEARDSLEY	K25-4	5-TONS BIN DIA. 5' BASE DIA. 8'
16	390	MULLER	40	F	SIMPSON	MD2	1000 LBS CAP
17	389	SHAKEOUT	50	F	SIMPLICITY	86 SXL	SIZE 5'X2'
18	359	SAND SLINGER	30	G	BEARDSLEY	NF 983X	7 TO 10 CU/FT/MIN. RAMMING CAR 6' RAM ARM
19	393	CUPOLAS	30	G	N/A	N/A	30" INNER BORE IRON MELT COKE FIRED
20	340	CUPOLAS	30	G	N/A	N/A	36" INNER BORE IRON MELT COKE FIRED

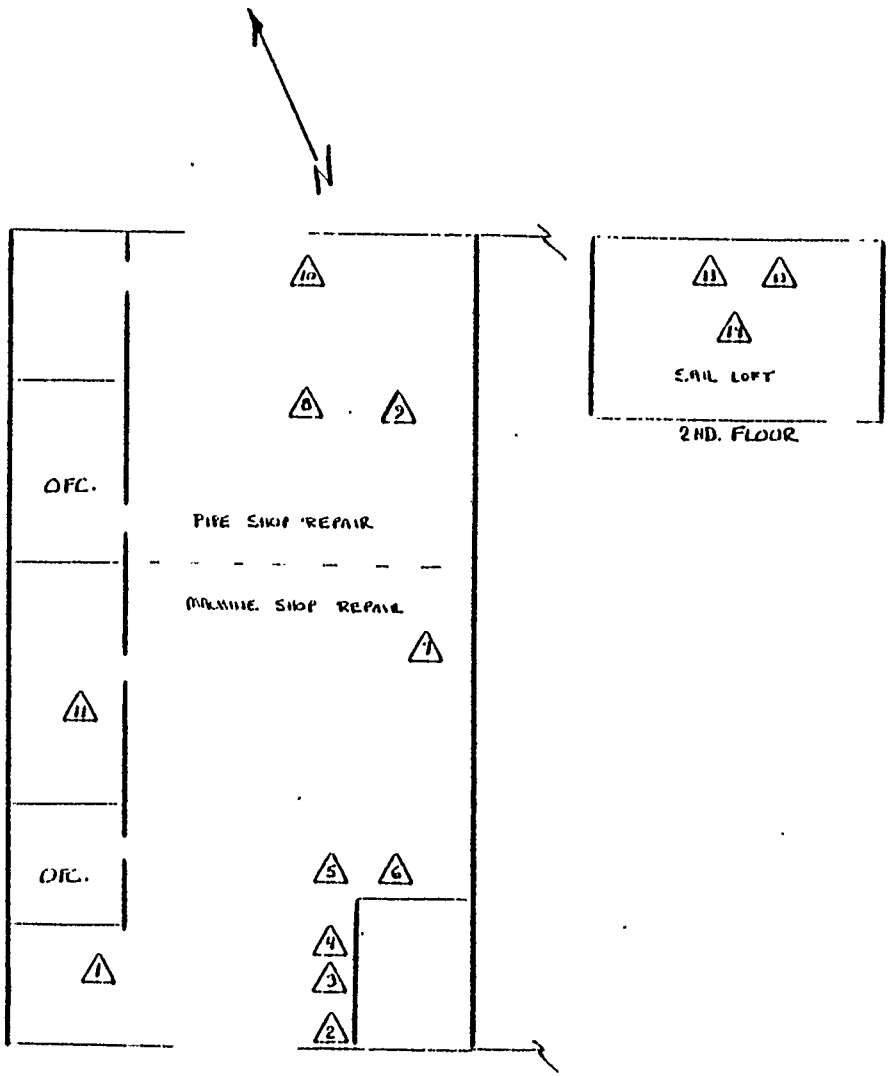
BY: J.R RUECKER
I & E. DEPT.

EQUIPMENT -- BLDG. 11 PIPE & MACHINE SHOP REPAIR & SAIL LOFT

AUG. 1980

REF NO	NASSCO NO	DESCRIPTION	AGE	COND	MFG.	MODEL	CAPACITY
MACHINE SHOP REPAIR							
1	N/A	PRESS	35	P	N/A	N/A	WIDTH OF OPENING 44"
							HEIGHT OF OPENING 44"
2	1117	GRINDER	20	F	N/A	PEDESTAL	2 WHEELS
							USED FOR TOOLS
3	31	DRILL PRESS	25	F	DELTA	DP220	BENCH TYPE
							7½" THROAT, 10" HEIGHT
							CLEAR MKE, JACOBS
							CHUCK
4	35	DRILL PRESS	25	F	BUFFALO	16	BENCH TYPE
							8" THROAT, 18" HEIGHT
							CLEARANCE, MORSE TAPER
							SPINDLE
5	309	BAND SAW			MARVEL	2	6"X6" MAX.
6	310	THREADER			RIDGID	999	PORTABLE
							UP TO 2" DIA.
7	951	BAND SAW	30	F	AMERICAN	N/A	26" THROAT, 9½" HEIGHT
							CLEARANCE, 22"X26" TILT
							TABLE
PIPE SHOP REPAIR							
8	225	THREADER	5	G	RIDGID	535	PORTABLE
							⅛" TO 2" DIA.
9	1115	GRINDER	20	F	N/A	N/A	2-WHEELS
							USED FOR TOOLS
10	N/A	BAND SAW	5	I	ROCKWELL	9	6" MAX.
11	N/A	GRINDER	5	F	N/A	N/A	2-WHEELS
							USED FOR TOOLS
SAIL LOFT							
12	10321	SEWING MACH.	10	I	SINGER	SMALL	USED FOR CANVAS
13	308	SEWING MACH.	10	I	SINGER	SMALL	USED FOR CANVAS
14	307	SEWING MACH	10	I	SINGER	7.31	USED FOR CANVAS

BY: J.R RUECKER
F & I E. DEPT.



BLDG. 11
PIPE REPAIR
MACH. REPAIR
SAIL LOFT

6-1879 JR

EQUIPMENT - CARPENTER SHOP BLDG 19

AUG 1980

REF NO	NASSCO NO.	DESCRIPTION	TYPE	COND	MFG	MODEL	CAPACITY
1	916	SAWDUST COLLECTOR	10	F	N/A	N/A	5' DIA. X 8' DUST COLLECTOR CYCLONE, 25 HP, 900 RPM
2	910	JOINTER	10	F	CRESCENT	2302	16" MAX CUT. TABLE 20" X 7'
3	1742	GRINDER	1	G	SEARS	PROFESNAL	2-WHEELS USED FOR TOOLS
4	1755	GRINDER	6	G	SEARS	337	BENCH MODEL 2-WHEELS SPECIAL ATTACHMENTS FOR DRILL BITS & SAW BLADES
5	944	BAND SAW	10	F	DELTA	103	13½" THROAT, 6" HEIGHT CLEARANCE, TABLE 14 X 14
6	1748	GRINDER	10	G	MILLER-FALLS	81	BENCH MODEL 2-WHEELS USED FOR TOOLS
7	909	DRILL PRESS	5	G	ROCKWELL	15-017	7½" THROAT, 36" HEIGHT CLEARANCE, TABLE 10½" X 10" JACOBS CHUCK 0-½
8	10152	BAND SAW BLADE WELDER	3	G	STRYCO	MF 3	UPTO 1½" BLADE
9	918	LATHE	3	G	POWERMATIC	90	MAX STOCK LENGTH 36"
10	942	DRILL PRESS	10	F	ROCKWELL	N/A	8½" THROAT, 18" HEIGHT CLEARANCE, TABLE 24" X 11", JACOBS CHUCK 0 ½
11	908	TABLE SAW	10	F	CRESCENT	N/A	10" DIA BLADE MAX. DEPTH OF CUT 3½" MAX RIP TO RIGHT OF BLADE 18 MAX. RIP TO LEFT OF BLADE 22
12	914	STENCIL CUTTER	5	G	DIAGRAPH	JUMBO	2" STENCILS ALPHA & NUMERIC
13	902	TABLE SAW	10	F	TANNEWITZ	TYPE U	MAX. DEPTH OF CUT 3½" MAX. RIP TO RIGHT OF BLADE 36" MAX RIP TO LEFT OF BLADE 11" WITH HOLZ-HER PIN FEEDER TYPE ET-117
14	957	SHAPER	10	G	YATES	4	VERTICAL SINGLE 1" SPINDLE, TABLE 18" X 44"
15	926	PLANER SURFACER	10	F	ORTON	25	SINGLE SURFACE UP TO 30" WIDE
16	905	BELT SANDER	10	F	SEARS	103	6" WIDE BELT TABLE 11" X 20"
17	901	BAND SAW	10	F	CRESCENT	N/A	34" THROAT, 11" HEIGHT CLEARANCE, 28" X 32" TILT TABLE
18	916	BAND SAW	10	G	N/A	N/A	37" THROAT, 12½" HEIGHT CLEARANCE, 30" X 37" TILT TABLE
19	918	SHAPER	10	F	SEARS	113	PORTABLE, VERTICAL SINGLE SPINDLE, TABLE 13½" X 27"
20	954	PLANER	10	F	ORTON	D-1	SINGLE SURFACE UP TO 30" WIDE
21	491	RADIAL ARM SAW	2	G	DeWALT	3571	20" BLADE TABLE EXTENDED TO LEFT 15' TABLE EXTENDED TO RIGHT 15'
22	21	TABLE SAW	10	F	TANNEWITZ	N/A	MAX DEPTH OF CUT 3½" MAX. RIP TO RIGHT OF BLADE 50" MAX RIP TO LEFT OF BLADE 20
23	945	RADIAL ARM SAW	10	F	DeWALT	N/A	12" BLADE TABLE EXTENDED TO LEFT 12' TABLE EXTENDED TO RIGHT 4'
24	253	RADIAL ARM SAW	10	F	DeWALT	GE 65	16" BLADE TABLE EXTENDED TO LEFT 10' TABLE EXTENDED TO RIGHT 6
25	N/A	BAND SAW	4	G	SEARS	12"	12" THROAT 1" HEIGHT CLEARANCE 12½" X 14" TILT TABLE
26	33	RADIAL ARM SAW	10	F	DeWALT	35020	20" BLADE TABLE EXTENDED TO LEFT 15' TABLE EXTENDED TO RIGHT 10'

BY: J.R RUECKER
F&T E Dept

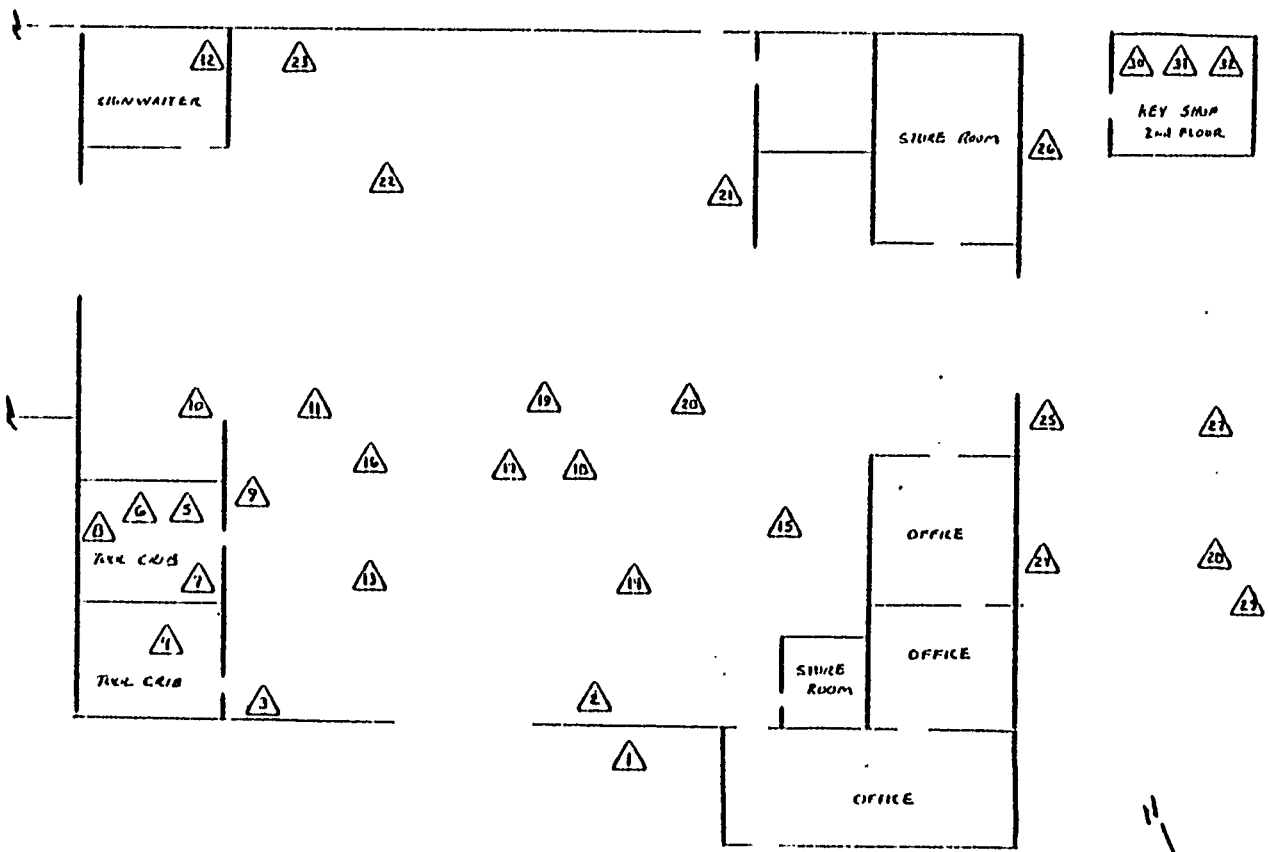
EQUIPMENT - CARPENTER SHOP BLDG 19

AUG. 1980

REF. NO	NASSCO NO	DESCRIPTION	AGE	CON	MFG	MODEL	CAPACITY
27	917	BAND SAW	10	F	TURNER	SH124	37" THROAT, 20" HEIGHT
							CLEARANCE, 38"X48"
							TILT TABLE
28	925	PLANER	3	G	ORTON	N/A	SINGLE SURFACE
							UP TO 30" WIDE
29	N/A	BAND SAW	10	F	N/A	N/A	22" THROAT, 17" HEIGHT
							CLEARANCE, 24"X 35" TILT
							TABLE
30	906	KEY DUPLICATOR	3	G	ILCO	2584	STANDARD KEYS MANUAL
31	907	ENGRAVING TORCH.	2	G	HERMES	1-1KII	5/8" HIGH LETTERS
32	912	KEY DUPLICATOR	5	P	CURTIS	2000	STANDARD KEYS AUTOMATIC

REF. NO	NASSCO NO.	DESCRIPTION	MFG	MODEL	CAPACITY

BY: J.R RUECKER
I.& I.F DEPT.



CARPENTER SHOP
BLDG 19
JUNE 1919
DIMR.

EQUIPMENT - PATTERN SHOP BLDG. 43

AUG. 1980

REF. NO.	HASSCO NO.	DESCRIPTION	AGE	COND	MFG.	MODEL	CAPACITY
1	384	RADIAL SAW	20	F	COMET	12R	12" DIA. BLADE 19" X 70" TABLE
2	368	JOINTER	30	G	CRESCENT	P-24	MAX. WIDTH 24" MAX HEIGHT 8"
3	377	PLANER	30	G	CRESCENT	N/A	MAX CUTTER WIDTH 12" TABLE LENGTH 6'
4	363	BAND SAW	40	F	N/A	N/A	34" THROAT, 8" HEIGHT CLEARANCE, 31" X 38" TILT TABLE
5	373	BAND SAW	40	F	N/A	N/A	30" THROAT, 12" HEIGHT CLEARANCE, 24" X 28" TILT TABLE
6	1711	GRINDER	20	G	SEARS	BENCH	2-WHEELS USED FOR TOOLS
7	387	BUFFER	20	G	STANLEY	216A	2 WHEELS
8	367	LATHE	30	G	N/A	N/A	MAX. DIA. 12" MAX LENGTH 50" WOOD ONLY
9	382	SHEAR	10	G	N/A	N/A	MAX WIDTH 13" USED FOR BRASS SHEETS
10	381	ENGRAVER	15	G	HERMES	N/A	MAX. LETTER HEIGHT 4"
11	391	HAND LETTER PUNCH	30	F	ROGERS	136	7/8" WIDE METAL TAPE
12	366	LATHE	50	P	N/A	N/A	MAX. DIA. 22" MAX. LENGTH 5' WOOD ONLY
13	380	DRILL PRESS	30	F	WHITNEY	BENCH	7½" THROAT, 30" HEIGHT CLEARANCE, JACOBS CHUCK
14	369	DRILL PRESS	20	G	DELTA	PEDESTAL	8½" THROAT, 30" HEIGHT CLEARANCE, JACOBS CHUCK
15	1710	DISC SANDER	30	G	KIMOT	N/A	24" DIA DISC 12" X 29" TABLE
16	371	SPINDLE SANDER	15	E	KIMOT	25P	MAX SPINDLE DIA @ HIGH SPEED 3", 4" MAX DIA. SPINDLE HEIGHT 11½" TABLE 30" X 24"
17	365	TABLE SAW	1	E	ROCKWELL	34-450	10" DIA. BLADE MAX. DEPTH OF CUT 3⅛" MAX TAK OF 45°CUT 2⅛" MAX RIP TO LEFT OF BLADE 15½", MAX RIP RIGHT OF BLADE 25"
18	392	BELT SANDER	20	G	PACIFIC	N/A	2" WIDE BELT
19	364	TABLE SAW	20	G	SEARS	101	PORTABLE DIA. BLADE N/A MAX DEPTH OF CUT N/A MAX RIP TO LEFT OF BLADE 8", MAX RIP TO RIGHT OF BLADE 11½"

BY: J.R RUECKER
FATE. DEPT

EQUIPMENT -- BOILER SHOP BLDG 73

AUG 1980

REF NO.	ASSET NO.	DESCRIPTION	AGE	COND	MFG	MODEL	CAPACITY
1	952	BAND SAW	30	P	DOALL	N/A	34" THROAT, 9" HEIGHT CLEARANCE, 31"X38" TILT TABLE
2	N/A	CUT OFF SAW	20	G	MERCURY	N/A	20" DIA. ABRASIVE WHEEL 3" THK. MTL.
3	11	HACK SAW	15	P	MARVEL	2	PORTABLE 5" THK MTL
4	1181	BRICK SAW	14	G	CLIPPER	N/A	14" DIA ABRASIVE WHEEL 20"X13" TABLE
5	1182	BRICK SAW	14	G	CLIPPER	N/A	14" DIA. ABRASIVE WHEEL 20X13 TABLE
6	1120	GRINDER	10	G	N/A	PEDESTAL	2-WHEELS USED FOR PRODUCTION
7	73	DRILL PRESS	20	F	DELTA	BENCH	8" THROAT 8" HEIGHT CLEARANCE, 22"X13" TABLE, MORSE TAPER SPINDLE
8	1721	GRINDER	15	G	MILLER	BENCH	2-WHEELS USED FOR TOOLS
9	12	HACK SAW	20	P	T&S ENG.	201	PORTABLE 2" THK. MTL.
10	N/A	LATHE	30	P	AMERICAN	N/A	10" MAX DIA. 8' LONG BED
11	10872	DRILL PRESS	30	P	BARNES	N/A	10" THROAT, 24" HEIGHT CLEARANCE, 17" DIA TABLE, MORSE TAPER SPINDLE

BY: J.R. RUECKER
I.I.E DEPT

EQUIPMENT - N/C CARPENTER SHOP BLDG. '19

AUG 1980

REF. NO.	VASSCO NO.	DESCRIPTION	AGE	COND	MFG	MODEL	CAPACITY
1	906	DRILL PRESS	10	P	DELTA	N/A	7" THROAT, 36" HEIGHT CLEARANCE, JACOBS CHUCK
2	10578	BAND SAW	2	G	SEARS	N/A	12" THROAT, 5" HEIGHT CLEARANCE, 18" X 19" TILT TABLE
3	N/A	RADIAL ARM SAW	6	G	DeWALT	710	10" DIA BLADE .3" MAX THK TABLE 22" X 10"
4	N/A	TABLE SAW	6	G	ROCKWELL	34-440	10" DIA. BLADE MAX. DEPTH OF CUT 3⅛" MAX DEPTH OF CUT AT 45° 2⅛" MAX RIP TO RIGHT OF BLADE 25 MAX RIP TO LEFT OF BLADE 15½ MAX WIDTH OF DADO 13/16"
5	1123	GRINDER	10	F	N/A	PEDESTAL	2-WHEELS USED FOR TOOLS
6	904	RADIAL ARM SAW	10	P	COMET	N/A	MAX DEPTH OF CUT 5" TABLE 32" X 16"
7	924	BAND SAW	10	F	YATES	N/A	24" THROAT, 12" HEIGHT CLEARANCE, 20" X 24" TILT TABLE

BY. J.R RUECKER
E.M.E. Dept

BURNING EQUIPMENT

AUG 1980

NASSCO NO.	MFG CODE	DESCRIPTION	AGE	COND	TYPES OF CUTS	QTY	LOCATION	NO OF TORCHES	TORCH TYPE	IN/MIN	CONTROLS OPT.	CONTROLS CNC	GAS-SHIP	GAS-NAT. GAS	MAX. PLATE SIZE FT.	TABLES MAG. NO.	TABLES NO USED	PL MARKING PUNCH	PL MARKING PAINT	TORCH 90°	SPECIFICATIONS REF CHART TOP BEV & 90°	SPECIFICATIONS REF CHART TOP & BOT. BEV	SPECIFICATIONS REF CHART TOP, BOT. BEV & 90°
STATIONARY EQUIPMENT																							
10101	CM-52	SHAPE CUTTER	15	P	SHAPE & LONGITUDINAL	1	C/W 598	1-6	C67	2 120	X			X	10X42	1	1	-	-	I	II (A)	III (A)	IV (A)
10868	CM 60	↓	10	P	↓		C/W 593	1-9	↓	2-30	X			X	10X40	↓	↓	-	-	↓	↓	↓	↓
10869	↓		12	F			C/W 595	↓		↓	X			X	↓			-	-				
536	CM 70		7	P			C/W 2000	1-6	C52	0-30 0-120	X	X		X	10X42	4	2	X			II	III	IV
537	CM 100	FLAME PLANER	6	G	LONGITUDINAL		C/W 2000	1-12	C67	0-40 0-240	-	-		X	↓	↓	↓	-	-		↓	↓	↓
538	CM 150	SHAPE CUTTER	4	F	SHAPE & LONGITUDINAL			1-2	PCM-B	0-50 0-250		X	X		10X40			X		VI	--	--	--
	CM 160	↓	2	G	↓		↓	1-8	C67	0-50 0-250		X		X	10X42	↓	↓	'	X	I	III (A)	III (A)	IV (A)
10815		FLAME PLANER	1	F	LONGITUDINAL		BLDG. 60	1 121	↓	0-80		-		X	↓	1	1	-	-	↓	II	III	IV
PORTABLE EQUIPMENT																							
	CM-37	3-WHEEL CUTTING MACH			CIRCLES & LONG RADIUS	1	—	1	C67	0-60	-	-		X	—	-		-	-	I	-	-	-
	CM-45	CUTTING MACH			LONGITUDINAL	39	BATENS	1-3			-	-		X	-			-	-	I	II	III	IV
	BUG O	CUTTING MACH. ARCH TRACK			LONGITUDINAL, VERTICAL, OVERHEAD, ETC.	32	WAYS	↓	↓	↓	-	-		X	-		↓		-	↓	↓	↓	↓
HAND EQUIPMENT																							
	C 66	HAND TORCH			ALL TYPES	APPROX. 2500	YARD	1	C66	-	-	-		X	-	-	-	-	-	I	-	-	-

(A) LONGITUDINAL CUTS ONLY

BY: J.P. RUECKER
FATE DEPT

TABLE-I 90° CUTTING CHART 1535 SERIES NOZZLES

PLATE THICK IN	NOZZLE SIZE	CUTTING OXY PRESSURE PSI	PREHEAT GAS PRESS PSI		CUTTING SPEED		IPM
			NATURAL GAS	OXYGEN	QUALITY CUT NO SLAG	MAX SPEED PIERCE CUT	TORCH TRAVEL SPEED 90° CUT
1/2	31	75	20	34	21	24	26
3/4		65			20	23	25
1	43	70			19	22	24
1 1/4		60	25	42	15	18	20
1 1/2	52	70				17	18.5
2	60	75	30	51	14	15	17
2 1/2		80			11	14	16
3		85			10	13	15
4		100	35	60	8	10.5	12.5

(A) QUALITY CUTS WITHOUT ADHERING SLAG NOT OBTAINABLE ON THESE THICKNESSES.

NOTE: THIS CHART DEVELOPED PER INFO FROM MANUFACTURES SPEC'S

TABLE II SINGLE BEVEL & 90° CUT 1535 SERIES NOZZLES

PLATE THICK IN	BEVEL ∠ DEGREES	NOZZLE SIZE		PREHEAT GAS PRESSURE		PREHEAT FLAME LENGTH		CUTTING OXY PRESSURE PSI	CUTTING SPEED IPM
		SQ CUT	BEV	NAT GAS (PSI)	OXYGEN (PSI)	SQ. CUT (IN)	BEV (IN)		
1/2	22 1/2	40	31	7	30	3/16 h	3/8 s	90	11
	35		40			7/16 h	5/16 h		10
	45						1/2 h		9
3/4	22 1/2						3/8 s		15
	35						5/16 h		14
	45						1/2 h		12
1	22 1/2	43	43				7/16 s		13
	35						7/16 h		12
	45						1/2 h		11
1 1/2	22 1/2	52	52				7/16 s	80	12
	35						1/2 h		11
	45					1/2 h			10
2	22 1/2	60	60			5/8 h	3/8 s		11
	35						5/8 h		10
	45						1/2 h		9
2 1/2	22 1/2					7/16 h	7/16 s	90	10
	35						7/16 h		9
	45						1/2 h		8

h = HARSH FLAME ABOUT 1.2 TO 1 OXIDIZING RATIO

s = SOFT FLAME ABOUT 1.5 TO 1 OXIDIZING RATIO

NOTE: THIS CHART DEVELOPED PER INFO FROM MANUFACTURES SPEC'S

TABLE V 90° HAND CUTTING 1535 SERIES NOZZLES

PLATE THICKNESS IN	NOZZLE SIZE	CUTTING OXY PRESSURE PSI	CUTTING OXYGEN FLOW cfh	PREHEAT GAS FLOW cfh	
				NATURAL GAS	OXYGEN
1/2	31	75	63	20	31
3/4	52	65	95	↓	↓
1	60	70	123		
1 1/4	↓	60	127	25	42
1 1/2		70	100	↓	↓
2		75	231	30	51

NOTE: THIS CHART DEVELOPED PER INFO FROM ESAB BRADY

TABLE VI 90° PLASMA ARC CUTTING PCM-8 OUTFIT

TORCH TIP DIA IN	NOZZLE ASSY PT-15	CUT GAS FLOW NITROGEN P-15 (DRY AIR)	GAS FLOW (ARC OFF)	CARRIAGE SPEED IN/MIN.	CURRENT AMPS	NO OF CUTS REQUIRED PAC-400	STANDOFF (TORCH TO WORK) IN.
1/8	.156 ORIF	42	8.0	200	275	1	1/4
1/4	↓	↓	↓	140	300	↓	↓
1/2				90	350		
3/4				60	375		
1				30	400		1/8
	.200 ORIF	52	8.5	65	575	2	↓
1 1/2	↓	↓	↓	33	600	↓	
2				20	↓		
	.230 ORIF	62	10.0	30	700		1/2
3	↓	↓	↓	13	450	↓	↓

NOTE: THIS CHART DEVELOPED PER INFO FROM MANUFACTURES SPEC'S

EQUIPMENT - WELDING

June 1979

REF. NO.	DESCRIPTION	MFG.	MODEL	QTY	CAPACITY USE	NO. OF OPER.	AMPS	AC	DC
1	POWER SUPPLY	AIRCO	CAV 200	3	MIG	1	200	–	X
2		MILLER	SRA 200	2				–	
3		P & H	HI 200	2				–	
4			SR 200	1				–	
5		LINDE	SVI 203	4				–	
6			VI 203A	23				–	
7		AIRCO	PA 1, 3	5			300	–	
8			DCFA 3P300M	15				–	
9			BUMBLE BEE	28				–	
10		ESAB	LCA 275	41				–	
11			LAE 315	25				–	
12		LINDE	SVI 300	2				–	
13		LINCOLN	RBS 300	14				–	
14		MILLER	SR 300	1				–	
15			MP 30R	18				–	
16		P & H	CV CVT 300	30				–	
17		NATIONAL CYC. GAS	DRM 300	20				–	
18		WESTINGHOUSE	RBS 250	8				–	
19			WSH 300	3				–	
20			RA 300	1				–	
21			ROP 300	3				–	
22		THERMAL ARC	PCH 250	1				–	
23		GILLILAND	MIG 2000	5				–	
24		AIRCO	MADIS 2HP	1			1100	–	
25		ESAB	LBA 400	48				–	
26			LAA 410	1				–	
27		THERMAL ARC	PCH 400	1				–	
28		AIRCO	ADI 500	1			500	–	
29		LINDE	VI 500	1				–	
30		NATIONAL CYC. GAS	DRM 500 HA	1				–	
31		GLEN PACIFIC	500 DC	1				–	
32		AIRCO	PC (TV)	1			600	–	
33			PC (PH)	1				–	
34		COBRAMATIC	600	2				–	
35		LINDE	VI 600	2				–	
36		LINCOLN	RBS 600	2				–	
37		MILLER	PC 65E	4				–	

REF. NO.	DESCRIPTION	MFG.	MODEL	QTY	CAPACITY USE	NO. OF OPER.	AMPS	AC	DC
38	POWER SUPPLY	P & H	CVT 600	19	MIG	1	600	–	X
39		WESTINGHOUSE	RS 600	1				–	
40			DUAL RBE 600	1				–	
41		ESAB	LBA 750	3	SUB-ARC		800	–	
42			LCA 800	12				–	
43		LINDE	VI 800	2	ELECTRODE	INVERTER		–	
44			VI 1000	7	STICK	INVERTER	1000	–	
45		NATIONAL CYC. GAS	DRM 1000	10				–	
46		P & H	N/A	1				–	
47		ESAB	LCA 1200	1			1200	–	
48		PINTS	N/A	1				–	
49		WESTINGHOUSE	RS-1200	1				–	
50		ESAB	LAD 1100	5			1100	–	
51		AIRCO / A.O. SMITH	N/A	6			1500	–	
52		DURALINE	N/A	8				–	
53		K.S.M.	STUD	2	STUD	1		–	
54		N.E.W.		3				–	
55		P & H		8				–	
56		VICKER		8				–	
57		MK PRODUCTS	4 BANNER	1	STICK	4	1100	–	
58		MILLER	MK VIII	18		8		–	
59			SARC-4P	51				X	
60			320/ADP	51					
61		LINDE	HDA 300	3	TIG	1	300		
62		MILLER	TIG RIG	12					
63		P & H	HFGW 300	3					
64			HFGW 500	1					
65		WESTINGHOUSE	WS-300	2					
66		LINCOLN	TM 300	93	MR ARC				
67		P & H	HI 300	58					
68		WESTINGHOUSE	TC 32	65					
69			AC-65	3					
70		A.O. SMITH	A-400L	47			400		
71		NATIONAL CYC. GAS	SAC 400	53					
72		ESAB	TAC 1000	1			1000		
73		LINCOLN	TM 1000	2					
74		ESAB	TAC 1500	5			1500		

BY J. R. Rueckert
I & I.E. Dept

EQUIPMENT - WELDING

JUNE 1979

REF. NO.	DESCRIPTION	MFG.	MODEL	QTY.	CAPACITY: TYPE	AC	DC	AMPS	COOLING	SPEED	WIRE SIZE
1	WELDER	LINDE	CONSTANT CURRENT	5	SUB. ARC						
2			CONSTANT VOLTAGE	1							
3			DS-15	3							
4		LINCOLN	LAF-3	1							
5		ESAB	AGDT	5							
6			A-2	5	SINGLE HEAD AUTO.						
7		WELD MOTION	"KAT"	3							
8		ESAB	AGDK	6	DUAL HEAD AUTO SUB ARC						
9		M.K. PRODUCTS	DOUBLE EX MK 12	2	DUAL HEAD AUTO MIG			750	WATER	0 60"	3/32 & 1/16
10		LINDE	N/A	5	ELECTRO SLAG						
11			CARRIAGE	4							
12		M.K PRODUCTS	PACK RAT	5	AUTO. FILLET RIG.					4 150"	
13			WIGGLER	15						1 10"	.035-.045
14		GENERAL ELECTRIC	IGNITRON	1	SPOT						
15		DAYTON	2 2 5 X 3	1							
16		KSM	SERIES D	1	STUD						
17			SERIES 6050	1							
18			POWERMATIC	2							
19			MK 32	3							
20			SAFEGUARD	1							
21			SERIES 6250	1							
22		NELSON	NS-20 MID	1							
23			NS-20 CONT.	15							
24			NS-20 GUN	15							
25		STRYCO	MF 3	2	BANDSAW				AIR	-	-
26		ESAB	N/A	75	GRAVITY						
27		AIRCO	WASP	2	GAS DRIVEN	X	X	200			
28		MILLER	AEA DOUBLE	3				225			

REF. NO.	DESCRIPTION	MFG.	MODEL	QTY.	CAPACITY: USE	NO. OF OPER.	AMPS	AC	DC
75	POWER SUPPLY	NELSON	TRIBOOA	1	STUD	1	1800	-	X
76	MOTOR GEN.	LINCOLN	IDENTICAL ARC	2	AIR ARC		200	-	
77		GENERAL ELECTRIC	N/A	1			1	-	
78		LINCOLN	SAE 300	13			300	-	
79		GENERAL ELECTRIC	N/A	10			1	-	
80		LINCOLN	SAE 400	7			400	-	
81		GENERAL ELECTRIC	N/A	3			1	-	
82		HOBART	AIM-600	2			600	-	
83		LINCOLN	SAM-600	3			1	-	
84			SA 750	5			750	-	
85			SA 800	3			800	-	
86		GENERAL ELECTRIC	N/A	2			1500	-	

BY: J.R RUECKER
FIRE DEPT.

EQUIPMENT - WELDING

JUNE 1979

REF. NO.	DESCRIPTION	MFG	MODEL	QTY	CAPACITY USE	CAPACITY AMPS	CAPACITY COOLING	CAPACITY TORCH ∠	CAPACITY WIRE SIZE
1	TORCHES	AIRCO	AH-30-F	5	MIG	300	AIR	60°	.015 .030 .035 .045 1/16
2			AH 50-F	1		500			.035 .045 5/64 3/32 7/64 1/16
3			AH-35-C	3		550	WATER	PISTOL	.030 .035 .030 .035 .045 1/16 5/64
4			AH 50 AI	2		600			.035 .045 1/16 5/64 3/32 7/64 1/8
5		ESAB	A 9	5		200	AIR	90°	.024 - 1/16
6		LINDE	ST-8	12				60°	.030 .035 .045 1/16
7			ST-13	5		250			.030 .030 .035 .045 3/16
8		M.K. PRODUCTS	MK-3A	100		300	WATER		.030 .035 .035 1/16 1/16
9			LONG COBRA	50		500			.030 .035 .045 .052 1/16
10		GILLILAND	N/A	5		N/A	N/A	N/A	N/A
11		LINDE	HW 9	12	TIG	110	AIR	60°-110°	.020 - 1/16
12			HW 11	1		N/A	N/A	N/A	N/A
13			HW 12	1		500	WATER	N/A	N/A
14			HW 18	20		300		60°-90°	.020 - 5/32"
15			HW 20	15		240		90°	.020 - 1/8"
16			HW 24	5		75	AIR	60°-90°	.020 - 1/16"
17		ARC-AIR	TS	10	AIRARC	N/A	N/A	N/A	N/A

REF. NO.	DESCRIPTION	MFG.	MODEL	QTY.	CAPACITY TYPE WIRE	CAPACITY SPEED RPM	CAPACITY TYPE TORCH	CAPACITY SPOOL DIA.	CAPACITY WIRE SIZE
1	FEEDERS	MILLER	30A	2	CORE				
2		NATIONAL CYC. GAS	SO 5	2					
3		LINDE	SWM 23	3		LO-LOO	AIR-WATER	12"	N/A
4		MILLER	MATSOI	3					
5		AIRCO	AHF RI	5	MIG	N/A	ANLOG	12"	.030 .035 .045 1/16
6			AHF-LI	1		N/A			
7		ESAB	A3	15		1/8-510	AIR	N/A	.030 - 0.47
8		LINDE	SWM-20	12		0 550		8"	.030 .035 .045
9		M.K. PRODUCTS	MK-3A	150			WATER	N/A	.030 .035 .045 .062
10		GILLILAND	MFR CODE	5					

REF. NO.	DESCRIPTION	MFG.	MODEL	QTY.	CAPACITY RADIUS & ZO	CAPACITY TRAVEL	CAPACITY SPEED	CAPACITY TRAVEL	CAPACITY SPOOL DIA.	CAPACITY WIRE SIZE
1	CARRIAGES	AIRCO		1	-	N/A	-	-	-	-
2		A.O. SMITH	CLIMBER	5	-	N/A	-	-	-	-
3		BUG-O	MK III	32	-	2-360	-	-	-	-
4		LINDE	CM 15	39	-	4-32	-	-	-	-
5			CM 99	39	-	0-60	-	-	-	-
6		WELD MOTION	"KAT"	5	-	N/A	-	-	-	-

BY: J R RUECKER
I & E DEPT.

EQUIPMENT - WELDING

JUNE 1979

REF. NO.	DESCRIPTION	MFG	MODEL	QTY
1	GRID PICKS	DURALINE	2100N	15
2			2100H	
3		N.E.W.	1013 B1	
4			20822	
5			10279CK	
6		DURALINE	MINI	100
1	WATER COOLERS	NASSCO	N/A	4
2		LINDE	WC-2	1
3			WC-6	2
1	FOOT CONTROLS	ARCTROL	ME-12	10
2		MILLER	HFC-23A	
3		P&H	FKS-1	
1	VACUUMS	INVINCIBLE	460	2
2		TORNADO	6700E	10
3			8500A	
1	PLASMA	LINDE	PSH-5	3
2		THERMAL ARC	PAK-11	1
3			CC 50	1
4			CC 60	1
5			PAK-1	1
6			PAK-6 B	1

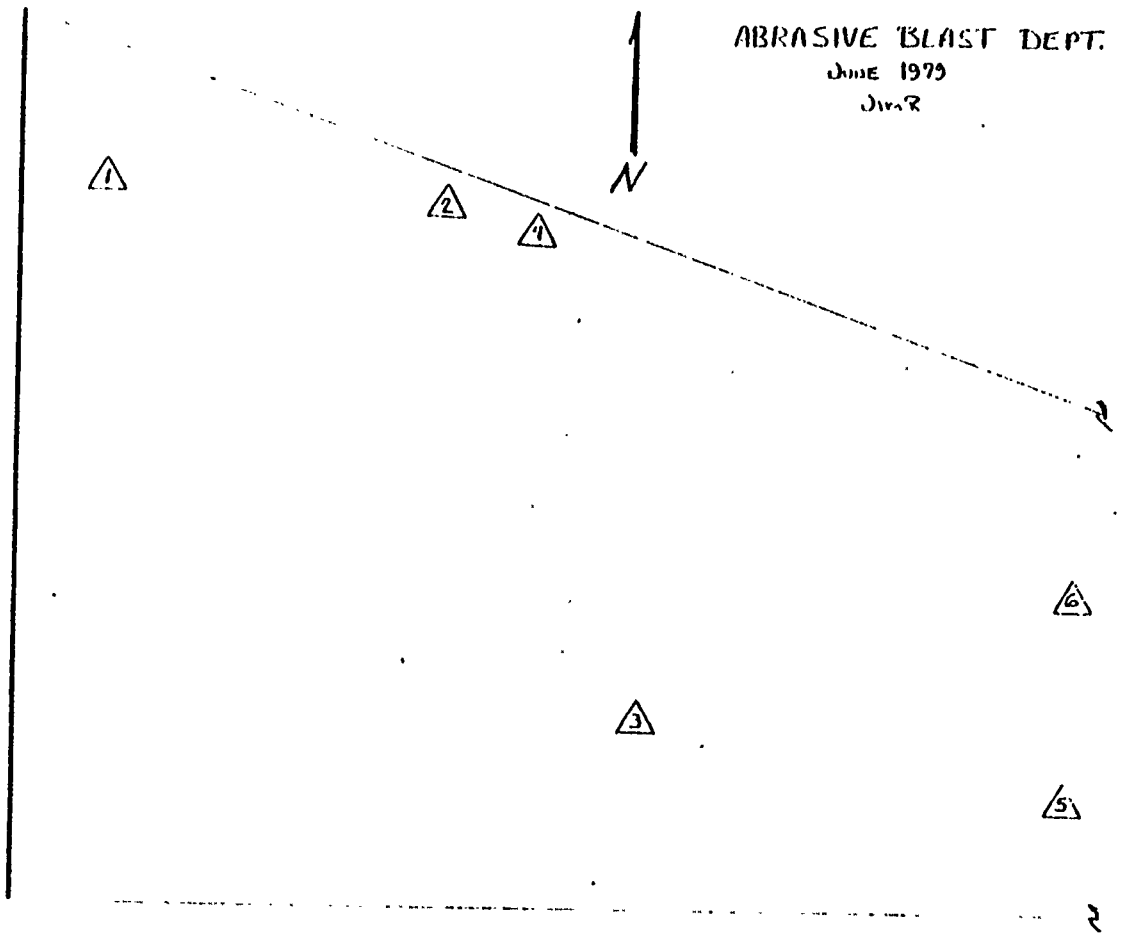
BY: J.R. RUECKER
I. & E. DEPT.

EQUIPMENT - ABRASIVE BLAST DEPT.

AUG. 1980

REF. NO.	NASSCO NO	DESCRIPTION	AGE	COND	MFG.	MODEL	CAPACITY
1	165	AIR DRYER/ RECEIVER			ZURN	R 940-A	CONTINUOUS DUTY CAP. INLET AIR 100°F @ 90 PSI
2	655	BLASTING UNIT #1	4	G			
					WHEELABRATOR	112	STEEL GRIT RECOVERY
					KEY	AC-50	ABRASIVE SEPARATOR
					KEY	1-6A	2-BLAST UNITS 4-TON CAP. EA WITH 8 NOZZLES PER UNIT
3	656	BLASTING UNIT #2	4	G			
					WHEELABRATOR	112	STEEL GRIT RECOVERY
					KEY	AC-50	ABRASIVE SEPERATOR
					KEY	1-6A	3-BLAST UNITS 4-TON CAP. EA. WITH 8 NOZZLES PER UNIT
4	22	WHEELABRATOR	15	F	WHEELABRATOR	1260	STORES UP TO 1 TON OF STEEL GRIT, HANDLES SMALL PARTS UP TO 1 TON.
5	653	KLEEN BLAST STORAGE	5	F	NASSCO.	N/A	4-100 TON STORAGE HOPPERS BUCKET ELEVATOR WITH TRAVEL CONVEYOR 16"W-20'L 50 TONS/HOUR FILL RATE
6	N/A	SLAG TUBS	6	G	NASSCO	N/A	24 TUBS USED FOR STORAGE & TRANSPORTATION OF KLEEN BLAST CAP. RANGES FROM 3 CY TO 6.75 TONS PER TUB, TOTAL TUB CAP. IS 156 TONS
7	N/A	PORTABLE POTS	6	G	CLEMCO/KELCO	N/A	600 LB CAP. TOTAL OF 59 POTS WHICH 40 ARE IN SETS OF 2 WITH A COMMON HOPPER
8	N/A	SPIN BLASTER	5	F	N/A	N/A	QTY-2 USED FOR INSIDE PIPE

BY: J.R RUECKER
F.&I.E. DEPT.


ABRASIVE BLAST DEPT.
June 1979
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EQUIPMENT - PAINT DEPT.

JUNE 1979

REF. NO.	DESCRIPTION	MFG	QTY	CAPACITY
1	PAINT PUMP	GRACO	4	MODEL - KING
				MAX. 3000 PSI
				AIRLESS APPLICATION
				USED FOR LARGE AREAS
2	PAINT PUMP	GRACO	4	MODEL - BULL DOG
				MAX. 3000 PSI
				AIRLESS APPLICATION
				USED FOR LARGE AREAS
3	PAINT PUMP	GRACO	3	MODEL - PRESIDENT
				MAX. 900 PSI
				AIRLESS APPLICATION
				USED FOR LARGE AREAS
4	PAINT PUMP	SPEE FLO	1	MAX. 1600 PSI
				AIRLESS APPLICATION
				USED FOR LARGE AREAS
5	PAINT PUMP	GRACO	1	MODEL - PRESIDENT BARREL
				MAX. 900 PSI
				AIRLESS APPLICATION
				USED FOR LARGE AREAS
6	PAINT PUMP	GRACO	1	MODEL - 350
				MAX. 3000 PSI
				USED FOR SMALL AREAS
7	PRESSURE POT	DeVILBISS	N/A	5 GALLON
				POT AGITATOR
				USED FOR HEAVY COATINGS
8	PRESSURE POT	BINKS	N/A	5 GALLON
				POT AGITATOR
				USED FOR HEAVY COATINGS
9	PRESSURE POT	DeVILBISS	N/A	5 GALLON
				USED FOR ALL TYPES OF
				COATINGS
10	PRESSURE POT	BINKS	N/A	5 GALLON
				USED FOR ALL TYPES
				OF COATINGS
11	PRESSURE POT	DeVILBISS	N/A	10 GALLON
				USED FOR ALL TYPES
				OF COATINGS.

REF. NO.	DESCRIPTION	MFG	QTY	CAPACITY
12	PRESSURE POT	BINKS	N/A	10 GALLON
				USED FOR ALL TYPES
				OF COATINGS
13	PRESSURE POT	DeVILBISS	N/A	2 GALLON
				USED FOR ALL TYPES
				OF COATINGS ON SMALL
				JOBS & TOUCH UP JOBS
14	PRESSURE POT	DeVILBISS	N/A	2 QUART
				USED FOR ALL TYPES
				OF COATINGS ON
				TOUCH-UP JOBS
15	PAINT CUP	DEVILBISS	N/A	1 QUART
				USED FOR LACQUER TYPE
				COATINGS
16	STRAY GUN	GRACO	N/A	TYPE - AIRLESS
				STANDARD PRODUCTION GUN
17	SPRAY GUN	GRACO	N/A	TYPE - AIRLESS
				IDLE GUN 6' TO 10' REACH
18	SPRAY GUN	GRACO	N/A	TYPE - CONVENTION
				PRODUCTION AIR GUN
19	SPRAY GUN	DeVILBISS	N/A	TYPE - CONVENTION
				PRODUCTION AIR GUN
20	SPRAY GUN	DeVILBISS	2	TYPE - I.D. TYPE PAINTER
				MIN. DIA 8"
				360° NOZZLE
21	PAINT MIXER	ARO	N/A	FOR 55 GALLON DRUMS
				1.5 CFM AIR MOTOR
				1500 TO 2800 RPM
22	CLEANER	HOTSY	1	HIGH PRESSURE CLEANER
				1000 PSI
				MODEL 4000

BY: J.R RUECKER
Ed E.E. DEPT.

EQUIPMENT - RIGGING LOFT

AUG 1980

REF NO	NASSCO NO.	DESCRIPTION	AGE	COND	MFG.	MODEL	CAPACITY
1	1761	GRINDER	15	G	STANLEY	PEDESTAL	2 WHEELS
							USED FOR TOOLS
2	10601	CUT OFF SAW		G	WALLACE	1710	10" DIA ABRASIVE BLADE
							4" THK CUT MAX
3	67	SWAGE	3	G	NATIONAL	1052	1000 TON
4	1101	DRILL PRESS	20	G	BUFFALO	16	8" THROAT, 15" HEIGHT
							CLEARANCE, MORSE
							TAPER SPINDLE
5	1762	GRINDER	10	F	DAYTON	PEDESTAL	1-WHEEL
							USED FOR PRODUCTION
6	349	LEAD POT	20	G	KNAPP	N/A	10" DIA. I.D.
							7" DEEP
7	1102	GRINDER	15	F	N/A	N/A	N/A
8	10203	RE-REELER	15	F	N/A	N/A	UP TO 8'
9	2301	DYNAMOMETER			DILLON	N/A	100,000 LBS
10	2302	DYNAMOMETER	12	G	DILLON	N/A	20,000 LBS
11	2303	DYNAMOMETER	12	G	DILLON	N/A	20,000 LBS
12	10206	DYNAMOMETER			DILLON	N/A	20,000 LBS
13		DYNAMOMETER	12	G	DILLON	N/A	50,000 LBS
14		DYNAMOMETER	12	G	DILLON	N/A	50,000 LBS

BY. J.R. RUECKER
F & L.E. DEPT

EQUIPMENT - YARD MISC.

AUG. 1980

ITEM NO.	NASSCO NO.	DESCRIPTION	MFG	MODEL	CAPACITY	AGE	CONDITION
1	851	CONVEYOR SYSTEM	N/A	N/A	MAX. PLATE WEIGHT 10 TONS	10	G
		INCLUDES:			MAX. PLATE SIZE 10'X35'		
		2-COLLOCATOR CARS			ABLE TO A "H" MANUAL MODE		
		3 TRANSFER CARS			PLATE THICKNESS 3/16" - 15/16"		
		2 TURNTABLES			MAX. SHAPE LENGTH 38'		
		18 ROLLER CONVEYORS			MIN. SHAPE LENGTH 10'		
					MAX SHAPE WEIGHT - 3 TONS		
					TRANSPORT SPEED		
					UP TO 100'/MIN.		
2	531	PANEL LINE	ESAB	N/A	MAX. PANEL SIZE	5	G
		4 STATIONS:			40 X 65'		
		1 TACK WELD			MAX THK. 1 1/4"		
		2-FIRST SIDE WELD			MIN. THK 5/16"		
		3-TURN OVER SECOND			MAX. WEIGHT 66 TONS		
		SIDE WELD					
		4- LAYOUT					
3	558	WHEELABRATOR	WHEELABRATOR	N/A	MAX. PLATE WIDTH 10'	18	G
		INCLUDES:			AVERAGE SPEED OF		
		WHEELABRATOR			10 LINEAL FEET/MIN		
		BLAST-OFF			PAINT BOOTH HAS		
		PAINT BOOTH			OVER & UNDER SPRAY		
					NOZZLES		
11	535	TEE WELDER	N/A OG DEPT	N/A	MAX. LENGTH 42'	11	G
					MAX. WEB WIDTH 30"		
15	N/A	FRAME BENDER	HYDE	N/A	COMPUTER-NUMERICAL CONTROL	1	E
					MAX. BEAM SIZE: 25" DEEP		
					ANGLE WITH 1/2 THK. WEB		
					8" FLANGE WITH 1" WEB		
					MIN. BENDING RADIUS:		
					25" DEEP SECTION - 40'		
					8" DEEP SECTION - 7'		

BY: J.R ROECKER
I.E DEPT.

REFERENCE A.

KEY HISTORY DATES

REFERENCES

A. HISTORY KEY DATES

B. DRAFTS For VARIOUS SHIP CLASSES

C. EQUIVALENT SHIP RATIO'S

D. PLATE YARD STUDY

E. PIPE FOOTAGES - PAST & CURRENT NASSCO CONTRACTS

HISTORY KEY DATES

	HULL	WAYS	TYPE VESSEL	START OF CONSTRUCTION	KEEL	LAUNCH	DELIVERY
SSNO	361	2	LST	06-02-67(A)	12-16-67(A)	09-28-68(A)	11-06-69(A)
LA	362	3	LST	01-22-68(A)	02-22-68(A)	11-23-68(A)	01-19-70(A)
DERICK	363	1	LST	02-19-68(A)	04-13-68(A)	03-08-69(A)	03-11-70(A)
ENECTADY	364	4	LST	05-20-68(A)	08-02-68(A)	05-24-69(A)	05-05-70(A)
UGA	365	2	LST	07-15-68(A)	09-28-68(A)	07-12-69(A)	06-30-70(A)
SCALOOSA	366	3	LST	09-13-68(A)	11-23-68(A)	09-06-69(A)	09-11-70(A)
INAW	367	4	LST	02-03-69(A)	05-24-69(A)	02-07-70(A)	01-08-71(A)
BERNARDINO	368	2	LST	06-02-69(A)	07-12-69(A)	03-28-70(A)	02-19-71(A)
LDER	369	3	LST	07-28-69(A)	09-06-69(A)	05-22-70(A)	04-22-71(A)
INE	370	1	LST	09-08-69(A)	12-13-69(A)	08-15-70(A)	06-17-71(A)
RTANBURG COUNTY	371	4	LST	11-17-69(A)	02-07-70(A)	11-07-70(A)	08-12-71(A)
RFAX COUNTY	372	2	LST	01-30-70(A)	03-28-70(A)	12-19-70(A)	10-07-71(A)
MOURE COUNTY	373	3	LST	03-06-70(A)	05-22-70(A)	02-13-71(A)	12-09-71(A)
RBOUR COUNTY	374	1	LST	05-11-70(A)	08-15-70(A)	05-15-71(A)	02-03-72(A)
RLAN COUNTY	375	4	LST	08-03-70(A)	11-07-70(A)	07-24-71(A)	03-30-72(A)
RNSTABLE COUNTY	376	2	LST	09-08-70(A)	12-19-70(A)	10-02-71(A)	05-18-72(A)
STOL COUNTY	377	3	LST	12-14-70(A)	02-13-71(A)	12-04-71(A)	07-27-72(A)
N JOSE	387	1	AFS-7	11-22-68(A)	03-08-69(A)	12-13-69(A)	09-30-70(A)
DWOOD COUNTY	360	1	BARGE	06-24-71(A)	07-01-71(A)	01-15-72(A)	04-04-72(A)
TRAMAR (ARIES)	382	4	OBO	11-24-71(A)	04-28-72(A)	02-17-73(A)	08-08-73(A)
TRASEA (ARIES)	383	4	OBO	11-06-72(A)	02-17-73(A)	10-20-73(A)	03-19-74(A)
RONADO (MARGATE	384	2	CT	09-07-72(A)	10-27-72(A)	06-30-73(A)	12-28-73(A)
RRY VALLEY(MARG)	385	2	CT	04-19-73(A)	06-30-73(A)	03-09-74(A)	07-10-74(A)
LSEA (MARGATE)	386	2	CT	12-10-73(A)	03-09-74(A)	10-19-74(A)	02-28-75(A)
DEN DOLPHIN (AER	390	3	SCT	03-28-73(A)	05-22-73(A)	01-19-74(A)	10-10-74(A)
DEN ENDEAVOR	391	4	SCT	08-13-73(A)	10-23-73(A)	06-15-74(A)	12-12-74(A)
LDEN MONARCH	392	4	SCT	04-01-74(A)	06-15-74(A)	02-01-75(A)	06-25-75(A)
S ROANOKE(USN)	393	3	AGR-7	10-06-73(A)	01-19-74(A)	12-07-74(A)	10-14-76(A)
RTH	394	3	SCT	09-09-74(A)	12-07-74(A)	07-19-75(A)	02-19-76(A)
AVER STATE	395	4	SCT	10-21-74(A)	02-01-75(A)	10-11-75(A)	04-14-76(A)
SE CITY	396	BD	SCT	03-31-75(A)	05-05-75(A)	02-12-76(A)	07-23-76(A)
ERICAN HERITAGE	397	3	SCT	05-27-75(A)	07-19-75(A)	04-10-76(A)	11-01-76(A)
ERSEAS CHICAGO	398	3	SCT	03-08-76(A)	04-15-76(A)	11-16-76(A)	06-30-77(A)
ERSEAS OHIO	399	4	SCT	04-26-76(A)	06-30-76(A)	01-26-77(A)	10-20-77(A)
ERSEAS NEW YORK	400	3	SCT	09-03-76(A)	11-22-76(A)	06-22-77(A)	12-08-77(A)
ERSEAS WASHINGTON	401	4	SCT	11-29-76(A)	02-02-77(A)	08-31-77(A)	03-15-78(A)
RMACSTAR	402	2	CT	07-29-74(A)	10-23-74(A)	05-31-75(A)	12-10-75(A)
RMACSUN	403	2	CT	04-21-75(A)	05-31-75(A)	01-17-76(A)	06-23-76(A)
RMACSKY	404	2	CT	11-10-75(A)	01-17-76(A)	08-21-76(A)	02-01-77(A)
ESTNUT HILL	388	4	SCT	07-07-75(A)	10-15-75(A)	06-22-76(A)	12-01-76(A)
TTANNING	389	BD	SCT	12-02-75(A)	02-20-76(A)	09-17-76(A)	03-01-77(A)
T. ALASKA	405	BD	SDT	07-26-76(A)	09-21-76(A)	07-21-77(A)	03-14-78(A)
T. SAN DIEGO	406	BD	SDT	05-09-77(A)	07-25-77(A)	05-06-78(A)	10-25-78(A)
CO ALASKA	408	BD	SDT	01-03-78(A)	05-09-78(A)	02-24-79(A)	12-04-79(A)
CO CALIFORNIA	409	BD	SDT	11-06-78(A)	02-28-79(A)	01-05-80(A)	07-15-80(A)
LLOWSTONE (USN)	411	2	AD-41	01-10-77(A)	06-27-77(A)	01-27-79(A)	05-31-80(A)
ADIA (USN)	412	3	AD-42	07-10-77(A)	02-14-78(A)	07-28-79(A)	03-03-81
E COD (USN)	413	2	AD-43	05-01-78(A)	01-27-79(A)	08-02-80(A)	10-30-81
(USN)	414						

AFS Combat Store Ship
LST Landing Ship Tank
OBO Ore Bulk Oil Carrier
CT Coronado Class Tanker
SCT San Clemente Class Tanker
SDT San Diego Class Tanker

NOTE: Revised to agree with Key Dates from Serial No. 30-2

Prepared By: A.J. Nadeau

* UNNAMED SHIPS

HISTORY KEY DATES

	HULL	WAYS	TYPE VESSEL	START OF CONSTRUCTION	KEEL	LAUNCH	DELIVERY
*	414	2	AD-44	08-03-79(A)	08-02-80 (A)	12-19-81	02-15-83
BLUE RIDGE	415	BD	CPC	11-01-79(A)	03-03-80 (A)	11-01-80	04-09-81
COAST RANGE	416	3	CPC	02-18-80(A)	06-02-80 (A)	12-20-80	05-28-81
SIERRA MADRE	417	4	CPC	06-05-80(A)	09-02-80	03-28-81	08-27-81
*	418	3	T-ARC-7	09-15-80	02-16-81	02-13-82	02-15-83
*	419	BD	IPC	11-03-80	03-02-81	10-03-81	03-01-82
*	420	2	IPC	11-30-81	03-29-82	10-30-82	04-01-83
*	424	4	LPC	05-04-81	08-03-81	03-06-82	09-02-82
*	425	BD	LPC	07-20-81	10-19-81	05-22-82	10-26-82
*	426	4	LPC	11-23-81	03-08-82	09-25-82	03-03-83

AD	Destroyer Tender
CPC	Carlsbad Product Carrier
T-ARC-7	Cable Repair Ship
IPC	Ingram Product Carrier
LPC	La Jolla Product Carrier

REFERENCE B.

DRAFTS For VARIOUS

SHIP CLASSES

NATIONAL STEEL AND SHIPBUILDING COMPANY

INTER-DEPARTMENT MEMO
32/GEN/JWR:sas/79-121

Date December 19, 1979

L. Bothell Dept.

Subject: Drafts for Various Ship Classes Job No.

From: J. Tucker Dept.

ast week, Brad Closson requested launch and delivery drafts for a number of ifferent classes of vessel.

aunch drafts are summarized below based upon actual data (A) from our files nd estimated values (E) for others. Vessels built in the dock have launch rafts reflecting the addition of ballast forward to obtain even keel float-off. an Clemente vessels built on the ways had several thousand tons of water allast aboard aft to control ways loading during launching.

CLASS		FORWARD	AFT
Del Mar (E)	Ways . .	3'	14'
Coronado (A)	Ways . .	2'	12'
Monterey Bulker (E).	Ways . .	3'	13'
San Clemente OBO (A)	Ways . .	2'	20' ←
San Clemente Tanker(A)	Ways . .	2'	17'
	Dock .	10'	10'
Catalina (E)	Dock .	11'	11'
San Diego (A) . . .	Dock .	11'	11'
Carlsbad (E)	Ways .	3'	14'
	Dock .	10'	10'
Ingram (E)	Ways .	2'	15'
	Dock .	11'	11'
T-ARC-7 (E).	Ways .	11'	19'
	Dock .	16.5'	16.5'
LST	NO INFORMATION		
AD-41 (A).	Ways .	7'	20'*
AOR-7 (A)	Ways .	1'	21.5'
AFS	NO INFORMATION		
Mariner	NO INFORMATION		

* Keel draft. Propeller extends 2.5' below keel

general, it can be anticipated that fine, heavy vessels such as T-ARC-7 nd AD's will be poorly suited to construction in the building dock due to mited water over the blocks.

rafts for tank testing, trials and delivery are not readily defined, but some meralizations are possible.

CONTINUED . . .

Berth 5 is not adequate for any of these functions for any vessel listed except the LST. Berth 2 is adequate for all functions for all vessels. The other berths fall between these two extremes, as follows:

BERTH 1: Too short for San Clemente, Catalina, and San Diego Classes. Adequate for all functions for all others except AD's, although utility would be improved if high spots along the pierside and next outboard line of soundings were eliminated. This would also permit the AD/s to use the berth for all functions. (NOTE: Safety concerns probably preclude use of this berth for dock trials to protect the dock gate.)

BERTH 3: Too short for most listed vessels, but ideal for T-ARC-7 and LST, and possibly acceptable for AFS and Mariner, if not blocked off by a vessel at Berth 2. For those vessels short enough to use this position, all functions are practical.

BERTH 4: Too short for San Clemente, Catalina and San Diego Classes. Adequate for all functions for all others.

BERTH 6: Too shallow for tank testing, trials and delivery for San Clemente, Catalina and San Diego Classes. Ballasting for trials prior to departure would be restricted for all others except LST. The degree of restriction varies, depending on the drafts at which trials are to be run, but channel depth puts a limit of about 27 feet on draft leaving the yard. Tank testing and ballasting for delivery should be possible at this berth for all vessels except the three biggest classes, mentioned above.

All of the above discussion does not consider questions of services to the ships or the adequacy of mooring fittings. If there are remaining questions on hull related items, feel free to contact me again.

P. A. Tucker

P. Tucker
Chief Naval Architect

cc: K. Evans
J. Lightbody
A. Lutter
K. Cooley
L. Haumschilt
J. Royle
S. Scoggins
T. Roach
J. Acton
T. Felts
J. Goff
E. Selich
File

REFERENCE C.

EQUIVALENT SHIP RATIO'S

June, 1981

YARD

EQUIVALENT SHIP RATIO BASED ON

TOTAL MANHOURS MINUS CG 8

NAVY	MANHOURS [1]	EQUIVALENT SHIPS	
LST Learning Curve Av.	901,626	0.64	
AFS	1,256,894	0.90	
AOR	3,053,769	2.18	
AD 41/42	5,536,017	3.96	
T-ARC	2,092,701 [2]	1.50	
COMMERCIAL			
OBO	1,342,571	.96	
CT	1,013,476	.72	
SCT	1,399,296	1.00	BASE
SDT	2,453,425	1.75	
CPC	1,699,569 [3]	1.21	
IPC	1,144,883 [4]	.82	
LPC	1,115,290 [5]	.80	

(1) From weekly budget recap report.
(2) Estimate per Al Gillilan.
(3) Trend projection on Hull 416 per Al Gillilan.
(4) Trend projection on Hull 419 per Al Gillilan.
(5) Estimate on Hull 424 per A1 Gillilan.

EQUIVALENT SHIPS

The concept of equivalent ships has been developed to provide a comm indicator for projecting past production trends into the future, the predicting future facilities requirements. The equivalent ship has been developed on the following:

1. Total new construction direct labor hours (cost groups 1-9 minus 8 engineering) by type vessel.
2. San Clemente Class Tanker (SCT) used as base for equivalent ship indicator.
3. Total new construction direct labor hours per type vessel divided by SCT hours equals equivalent ship indicator for that type of vessel.

EXAMPLE:

TYPE VESSEL	MANHOURS (CG 1-9 Minus 8)	EQUIVALENT SHIPS	
SCT	1,399,296	1.00	Base
CT	1,013,476	.72	
SDT	2,453,425	1.75	
AOR	3,053,769	2.18	
AD	5,536,017	3.96	

REFERENCE D.

PLATE YARD STUDY

REPORT ON THE STEEL PLATE YARD

Presented by: B. T. McAlester

Tidman Industrial Engineering Services

TABLE OF CONTENTS

I would like to thank the many members of NASSCO staff who provided information and assistance in compiling this report.

Trevor McAlester

SUMMARY

The steel plate yard operates under the most severe restrictions, because of a system of estimating that ignores reality. The quality and consistancy of information used by individuals and departments is very inadequate. In the investigation, comments like, "The people in the yard should work harder" shows a lack of understanding or the manufacturing function. Other ideas of how to solve the impending problem range from extending the yard, a new crane, of outside warehousing. Seven options are given consideration in differing levels of depth, and included are all those which were given as ideas by people who were consulted.

Only one stands out as the obvious choice, and only one meets the needs of the shipyard. Reduce the number of plate sizes to a manageable number. It will save money, it will work.

INVESTIGATION BRIEF

What is happening now in the steel yard with respect to its ability to service the shipyard with plate?

How much more plate can the system handle?

What changes to the steel yard and handling systems will be required to meet the needs of the shipyard in the future?

INDRODUCTION

The material handling system in use at the steel yard encompasses the following equipment:

1 tracked crane, 15 ton capacity, Crane No. 507.

Various railcars supplying incoming steel to the yard.

These are the items used in the direct locality of the yard, but other pieces of equipment are used directly down the yard. Balanced capacity is very important to the successful operation of a materials handling system. An evaluation of the wheelabrator and collacator capacity is given in this report.

CURRENT SITUATION

The steel stock yard is supplied by railcar with steel based on the requirements of the building program and, where applicable, economic purchasing. The crane is required to unload these plates and locate them at different parts of the storage area. This work is done one plate at a time. The crane services the wheelabrator to provide the shipyard with its basic raw material-this also is done one plate at a time.

*There are at present approximately 2400 different plates by size, thickness and grade.

There are 270 different location sites in the stock yard at present.

127 are piles with the same plate all the way through the pile.

143 are mixed piles where some or all the plates may be different.

*Based on analysis of listing of Master File-Steel Requirements. 08/17/80.

In evaluating the capacity of the crane in the steel yard certain basic information has been gathered. As follows :

The crane travels at	6.25	feet per second
Pick-up time	12.00	pieces per second
Lower and release	15.00	pieces per second
Length of craneway	535.00	feet end to end

OPERATIONAL SEQUENCE

1. Travel to plate
2. Pick-Up (lowering and transverse travel occurs during travel) .
3. Travel to drop.
4. Release (lowering occurs during travel).

The average time taken to process a plate is equivalent to travelling half way down the track, pick up, travel half way back up the track, lower and release.
The total average sequence time is:

112.6 seconds or

1.88 minutes.

There is a lifting ratio of simple lifts from solid piles to complex lifts from mixed piles. Work records show that this ratio is running at

25% lifts from solid piles.

75% lifts from mixed piles.

Total Hours per Weekday	*22.50*	
Total Hours on Saturday	*15.50*	
* Therefore, total available hours	*677*	
Hours lost to down time	*97.50*	14.40%
Actual available hours	*579.50*	
Less 10% allowances	*521.55*	Net Hours
Total lifts	*44,329*	
Number per hour	*85*	
Total staged	*1,183*	
Total to wheelabrator	*1,822*	
Time to Stage or to wheelabrator	*1.88*	Minutes
Total time required	*5,649.4*	Minutes
	94.15	Hours

THE EFFECTIVE LIFTING ** 13.90% OF **TOTAL AVAILABLE HOURS**

The average time taken for a non-productive lift is:

$$\frac{\text{(Total Lifts - Productive Lifts)}}{\text{(Total Net Hours - Time Required for Productive Lifts)}}.$$

$$\frac{(44329 - 3005)}{(521.55 - 94.15)} = \text{Lifts per hour}$$

$$= 96.68$$

$$= .62 \text{ Minutes per lift.}$$

Reference period data from crane records 7-17-80 - 8-26-80.

Includes down time on wheelabrator and collacator as these affect the crane.

Effective lifting is where a plate is moved to the **wheelabrator as opposed to moved aside to another stack.

CURRENT OUTPUT

Based on the tonnage and the number of plates in the yard at 08-24-80.

23184.5 tons

10354 plates

The average weight of each plate is:

2.239 tons

The work records show that 1,822 plates where placed at the wheelabrator during a 28 day period.

Average weekly tonnage:

65.07 plates x 5 days x 2.239 tons

728.47 tons/week.

The greatest number of plates moved to the wheelabrator during the reference period was 130.

If this output could be sustained, average weekly tonnage:

130 plates x 5 days x 2.239 tons

1,455.35 tons/week

NOTE : The actual number placed at the wheelabrator during the week when 130 were placed in one day was 347 an average of 69.4.

CURRENT SITUATION

CONCLUSIONS

It is evident from the information available that the crane is working at a very effective level of performance.

The only significant opportunity to improve the operating effectiveness of the crane would be by reducing the level of down time to about 4%.

If this were possible the improvement in good lifts would only be:

Total Available Hours	677	
*Hours Lost to down time	29.78	
Actual available hours	647.21	
Less 10% allowances	582.49	
At 85 lifts per hour Total lifts	49,512	
Effective lifting @ 18.05% of net available hours	105.13	Hours
	3,355	Lifts
Current Lifting activity	3,005	Lifts
IF down time can be reduced to 4% new lifting capacity	3,355	= 11.6% Increase.

*Down time hours calculated on a reduction of 10% from 14.4% to 4.4% and the 14.4% is a total figure from the crane, wheelabrator and collacator.

NOTE : These values are based on a tonnage in the steel yard of approximately 23,000.

OPTIONS AVAILABLE TO INCREASE CAPACITY OF PLATE YARD

These appears to be several ways in which the company could go in order to increase its capacity in the plate yard.

Among these that could be considered are:

(I) Increase the size of the plate yard.

(II) Buy another crane.

(III) Do both (I) and (II) above.

(IV) Vertical stacking of plates.

(v) Lease or buy outside storage capacity.

(VI) Schedule plates far enough in future to "kit each days production etc.

(VII) Standardize plates bought by company.

OPTION ONE

Increase size of plate yard.

The general shortage of available real estate limits the amount by which the yard can be increased.
Additionally, the current location of the railway tracks reduces the utilization of the available space.
In the drawing a general consideration is given to the kind of change that might be incurred if the yard were extended. It is difficult to be precise and the net change in effect is small.
This change in available space increases the number of stacks from the current 270 to 434.
The current 270 are split as follows:

127 solid 47%

143 mixed 53%.

The greatest benefit that can be accrued to the crane can be achieved by using all the increase in stacks for mixed stacks. This would increase the number of mixed stacks by

164 or by

11.5 % .

This increase will be diminshed somewhat by the extra distance required to get the plates. *

The current lifting ratio of non-productive lifts to productive lifts is 7. 19/l.

If the yard area for mixed stacks is increased by 115%. Then the Lifting ratio will change to 3.34:1. As the larger number of mixed stacks will allow fewer mixed plates in each stack.

The time for a productive lift will increase by the additional amount of time required to travel. At 6.25/see. over the longer distance (855' - 535') - 6.25 = S1.2 secs.

The time for a productive lift in the new yard would be: 112.8 + 51.2 = 2.73.

This represents an increase of 54.3%.

Therefore, the new lifting ratio would be = 4.85/1.

This represents a 32.5% increase in output from the crane.

A 32.5% increase in output would represent the following:

Total staged	1,567
Total to wheelabrator	2,414

This increase in output by the crane is based on tonnage in the yard of 23,000 and this equated to 10,354 individual plates.

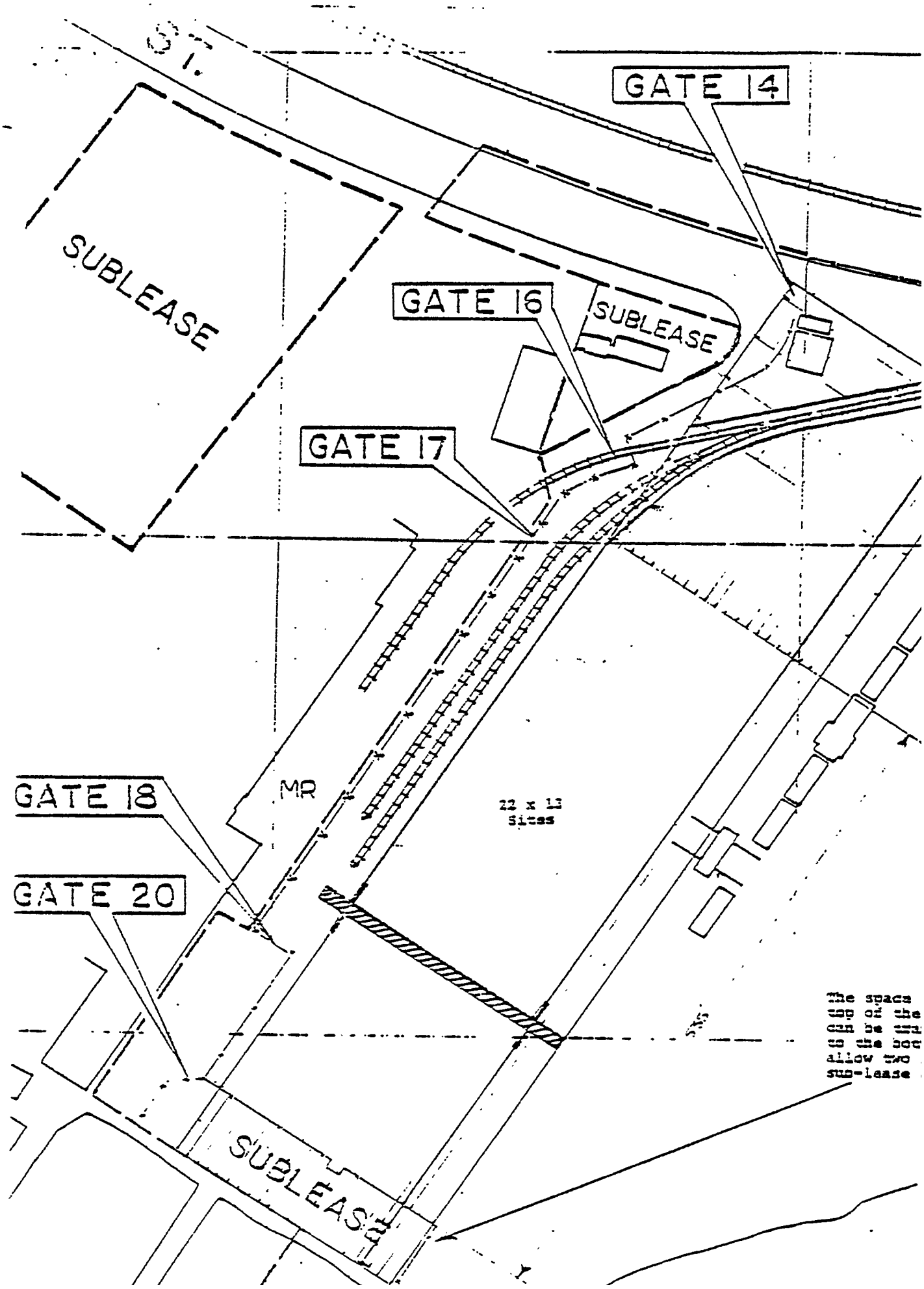
If the tonnage rises to 34,500 then the lifting ratio changes from: 4.85:1 to 7.275:1.

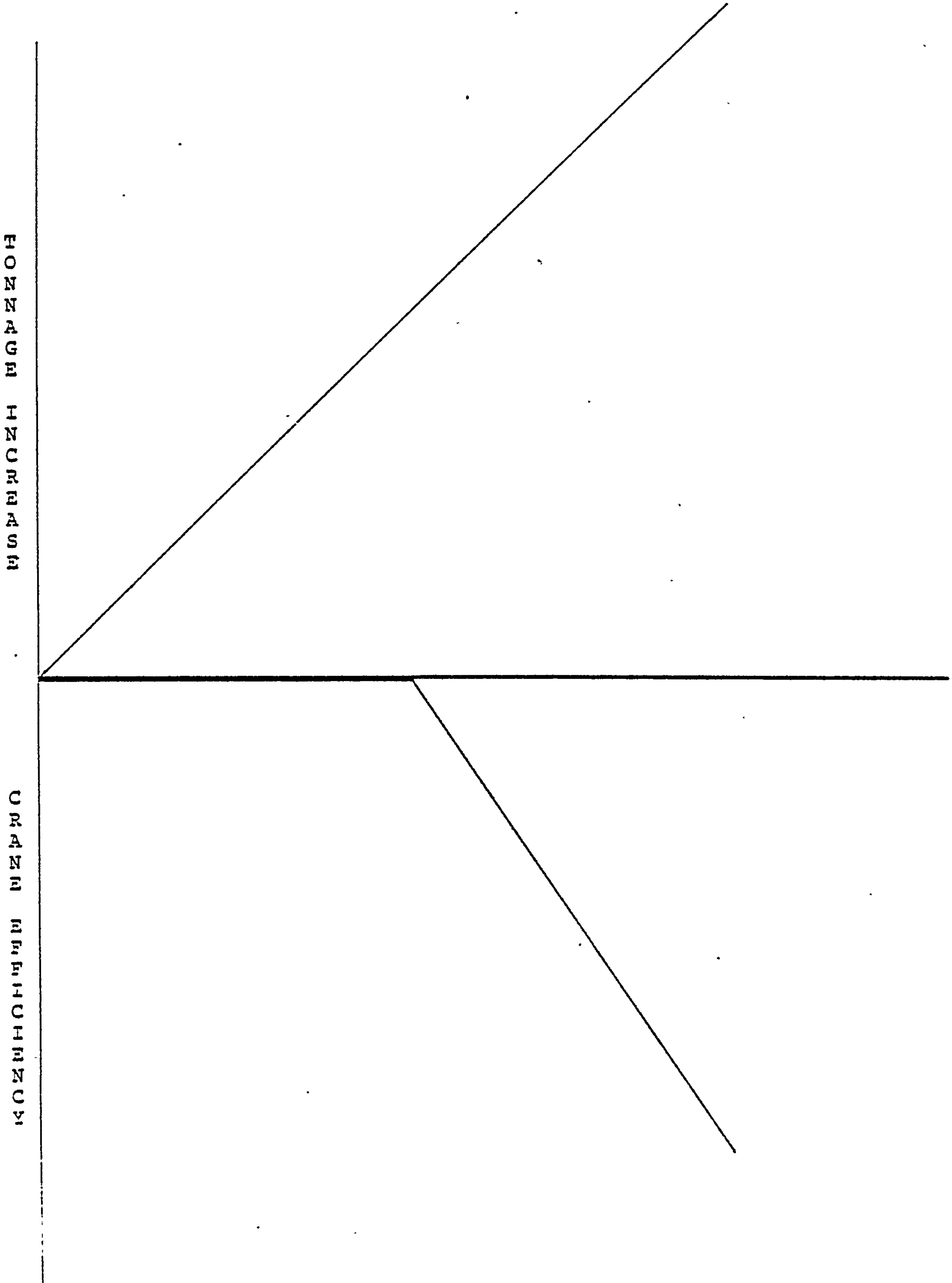
This means that in spite of increasing the yard size by 60% the capacity of the crane goes down by 1.18% on its current performance.

If the tonnage rises to 46,000 then the lifting ratio changes from: 4.85:1 to 9.70:1

This would result in a reduction in crane capacity of: 34.9% on its current capacity.

*Plates are randomly stacked in the yard.


GATE 14
SUBLEASE
GATE 16
SUBLEASE
GATE 17
GATE 18
GATE 20
MR
22 x 13
Sites
SUBLEASE
The space
top of the
can be ins
to the bot
allow two
sub-lease


TONNAGE INCREASE
CRANE EFFICIENCY

CONCLUSIONS

The increase in the size of the yard by 60% ***produces*** only a 32.5% increase in capacity.

Taking into account the limited amount of real estate this represents a very expensive option.

It would require significant expenditures to achieve and eliminate the use of the roadway at Gate 14.

Apart from the **liizited increase** ***in*** capacity that is made **available** by this particular option, it is vital that it is understood that ***this*** increase is ***only*** valid if the stock level. remains ***at around*** 25,000 tons. As stock levels rise crane capacity declines.

The whole policy of economic ordering ahead of time is done without any realization that it inhibits manufacturing. The extreme case would be where steel was given to the company at no charge and stock piled to such an extent that no ships could be built.

RECOMMENDATION

OPTION ONE

In view of the very limited advantages **that** ***are made*** available in option One and its general lack of viability it should not be cansidered.

OPTION TWO

Buy another *crane;* retain current size of yard.

Using the same reference period data theoretically, it would be possible to double the output of the yard to:

88658 lifts

2366 staged

3644 to wheelabrator

Because interference wiLL occur between the two cranes the actual increase in output will be reducsd by an amount due to interference. If the number of plates lifted to the wheelabrator rises then the level of interference will rise.

If a second take-off *station were* provided for the wheelabrator this interference would be *eliminated.*

COST OF NEW CRANE

The projected test **of** a new crane would be approximately $2,000,000.

OPTION Two BUY NEW CRANE

CONCLUSIONS

The addition of a new crane will offer a very low increase in output from the yard at a very high cost. There is an extended period of time prior to delivery. There would be a technical requirement to split the yard into two sections for purposes 05 production planning and control. The precision with which this planning needs to be done is of a very high order. Failura to maintain this ***planning quality*** would reduce even farther the output of the yard.

RECOMMENDATION

OPTION TWO

With the low increase in output and the very high cast involved, this option is even less viable than Option One.

OPTION THREE

Increase size of yard.

Add new crane.

By combining the increases gained in Option One and Option Two. i.e.

32.50% Increase generated by increasing the size of the yard

100.00% Increase as a result of purchase a crane.*

The addition of a second crane would reduce the time required to take a plate to the wheelabrator as the average distance travelled to obtain a plate would be reduced from 855' to 428'. This reduces the lift time from 2.73 miutes to 1.59 minutes.

This represents a reduction of 42% of the time spent on productive lifts.

The current amount of time spent on productive lifts is 13.90% of the net available hours. If onLy 58% of this time is used because of a shorter distance travelled, then 5.8% of the net available hours is exposed for lifting. The actual percent of time spent on productive lifting as a result of the use of two cranes will be 14.70%. This means that the theoretical increase in output resulting from the second crane would be 106%. However, interference would reduce this to about 100%.

predicted output generated by Option Three with current tonnage in yard.

Option One:	Total staged	1,567
	Total to wheelabrator	2,414
Option Two:	100% increase	3,134
		4,828

RECOMMENDATION

OPTION THREE

The very high costs associated with this option make it unattractive and it cannot be recommended.

OPTION FOUR

Vertical stacking.

The use of vertical stacking in the yard will require a change in handling technique from the present magnetic lifting device to a mechanical lifting device. (See illustration,)

If the current number of different plates is maintained (2,400), it will require as an optimum 2,400 discrete sites for these plates. With the current yard at 535'' long it would be possible to have 13 sites down the yard each capable of holding a 40' plate. In order to accommodate 2,400 different size/thickness/width combinations it would require 185. locations in each 05 the 13 sites. Within the yard layout at present each of these location could only beal wide.

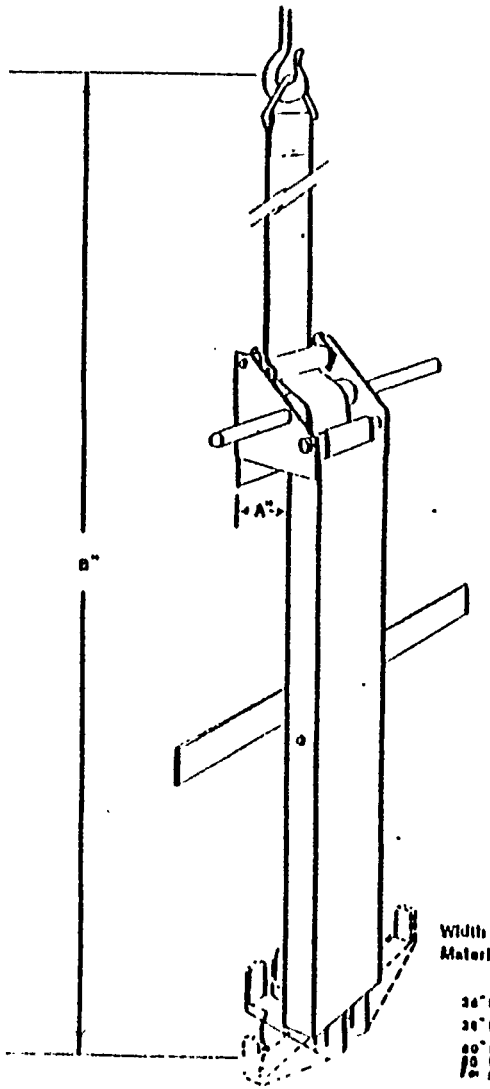
If the yard is extended as shown in option one then it would be possible to have 21 sites down the yard and would require 114 lacations in each of the 21 sites. This would mean that each location would be 1.67' wide. With vertical stacking" it will he necessary tochange the plane of each plate several times in order to process the plates to the wheelabrator. They will probable increase the hazard associated with handling plates. With vertical stacking it would be necessary to have a rigger working with the crane operator. Where there is more than one plate located at one site there would be additional handling required to isolate a plate for lifiting

Announcing a new product development from DEAN RESEARCH CORPORATION

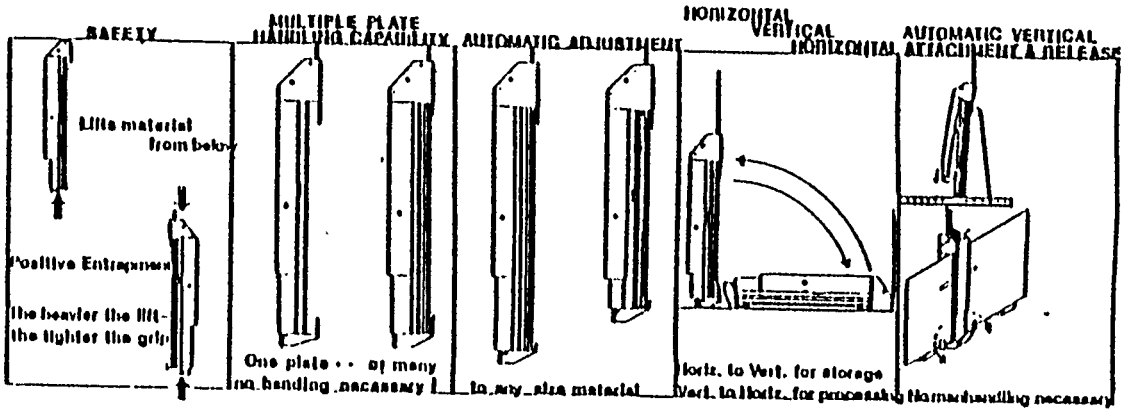
THE

VERTI-PLATE LIFTER

An under-the-hook device for handling flat stock IN and OUT of vertical storage

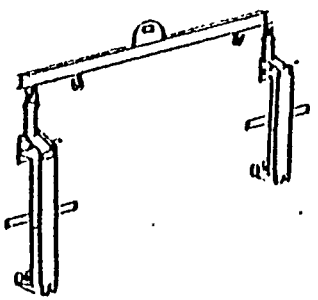


FEATURES INCLUDE:



2½ TON LIVE LOAD CAPACITY

FOR 6 TON LIFTS — WE OFFER A TWO LIFTER/LOAD BEAM ASSEMBLY



AVAILABLE MODELS

Width Range of Material to be Lifted	Model Number	Capacity	"A" Dimension	"B" Dimension	Unit Wt.
36" to 48"	44-3648	5000 lbs	4"	78"	100 lbs
36" to 60"	44-3660	5000 lbs	4"	90"	100 lbs
60" to 96"	44-6096	5000 lbs	4"	126"	130 lbs
60" to 96"	44-6096	6000 lbs	4"	138"	150 lbs

For plate over 108" in width, custom lifters are available

Dean Research Corporation
9100 NW 97th St Terr
Kansas City, Missouri 64153
(816) 891-7600

STOCKMASTER

Verti-Plate Lifter

27

OPTION FOUR

Vertical stacking.

RECOMMENDATION

There are significant costs associated with the introduction of vertical stacking and the benefits are more limited than at first apparent.
It is not a recommended option.

OPTION FIVE

Obtain outside warehousing to hold steel.

In order to meet the requirements of the yard and retain total Flexibility on **plate** selection. The use of outside warehousing is a very obvious option.
There would be a distinct advantage in this approach as it would allow the shipyard plate area to be reduced and this may have considerable benefits to the requirements of the yard.
The disadvantages associated with the use of an outside warehouse ***can*** be identified as follows; cost, and control.
The cost of land in the area is approximately $0.25/square foot and to obtain a plot of similar size to the steelyard would cost $30,000 Leasing would cost between $5,000 and $20,000 per annum. A crane would need to be purchased and a system of hauling the steel to the shipyard would have to be obtained, possibly leased or bought low-loaders.
The additional labor and administration would add to the ***cost*** and create a new requirement in production planning and control. This is already causing theq crane excessive unproductive work. The opportunity ***for con-*** fusion and error with two plate yards are considerable.

OPTION FIVE

Obtain outside *warehouse.*

RECOMMENDATION

High ***costs,*** additional administration and labor-essentially it complicates, cannot be recommended.

OPTION SIX

Kit-out yard by days of work.

The yard at present caters for 270 sites for the steel. In theory it *is* possible to ***allocate*** a days *work* to **each** site only if each days work is organized in **the** order in which it is required will it be possible to benefit from this re-organization.*

TO achieve this will require a high order of production planning and control.

AS a system it could affect or complicate ecanomic ordering ahead of schedule.

The biggest advantage that this option provides is a retention of flexibility, and no costs involved in implementation.

*At present 9-19-80 the panel line is approximately 1,500 tons ahead of sub-assembly and this is not **a** strict requiresment.

OPTION SIX

Kit-out *yard* by days of work.

RECOMMENDATION

The difficulties of organization make this option insufficie
attractive to recommend.

OPTION SEVEN

Standardization of plates available in plate yard. (Reducing the number of plate sizes to a manageable number.)

The concept of standardizing the plates in the plate yard is perhaps the most difficult to come to terms with:

With the current quality of information available it is also extremely difficult to prove that it is worthwhile, it is much easier to raise "red-herrings" as to why standardization will not work. In order to try to determine whether or not standardization is the best option, consideration must be given to many factors.

(I)cost

(11) Shipyard Operations

(III) Design

(IV) Production Planning Control

(v) Purchasing

(VI) Steel *Control*

(VII) Estimating

(VIII) Long Range Planning

COST

In determining whether or *not* it *will cost more money to* Standardize, it is necessary to consider what happens to plate in the shipyard now. The essential element in extra ***cost is what*** additional material will be scrapped as a result of standardization-me answer is no more material will be scrapped At present material that is a remnant is used by the Plate Shop for fittings and other requirements. Estimating use a 14% allowance for scrap. The definition of scrap is: The difference between the total material purchased minus the total material used less any destroyed by processing. The current Level **at scrap** *identified* by this definition is 4.71%. With the retention of current policy using remnant there is no reason to have any increase in scrap. In addition to not using ***anymore*** material there are some significance cost savings to be gained by standardization.

(1) Reduction in utilization of the **crane in** the *steelyard* to one eight hour shift a day. Labor *Cost* Saved** **$69,243.27 p.a**

Electricity saved*** 27,213.56 ***p . a***

$96,456.83 p.a.

This sum of money would at current **market** rates **of** $435 per ton buy 221.73 tons of steel or 5.76% **of the actual** tons across the platen in 1979.

There are additional ***savings in*** purchasing steel Control and a reduction of waiting time down the **yard.**

* Information supplied by T. Martin.

** Based on $9.30 per hour plus variable overhead.

***Source *Mr.* B. Phelps.

Standardization to a prescribed level will alLow the shipyard to operate more effectively then **at** present. The 507 crane will be able to, met the projected demand with only one shift operating. It could lift 1,085 plates in one week on one shift. At present it effectively lifts 325 to the wheelabrator in one week of three shifts and six days, and on average 308 plates from railcars to the yard. These may be considered as effective Lifts and **therefore the** current effective lifting is 325 + 308 per week in 128 hours.

$$\frac{128}{223 \div 308} = .202 \text{ hours/Lift}$$

Proposed lifting.

$$\frac{40}{1,085} = .036 \text{ hours/lift}$$

This represents an inprovement of: 561.11%

The steelyard as at the start of operations in the shipyard and it is essential that is operates as efficiently as possible. If the crane cannot support the yard then when the buffer stores run out the major shipyard operations will cease.

Based on discussions with D. Krumweide responsible for hull design/drafting there are no restraints imposed by the introduction of standardization.*

It is worth noting that considerable flexibility exists already. This flexibility is imposed by the fluctuating supply of steel.

*Standardization would only modify the number of grades in agreement with the design and engineering requirements of the ship, as grade of material may be a design or contractural requirement.

PRODUCTION PLANNING AND CONTROL

Production planning and controal are required at present to obtain specific plates, which imposes the very high work load on the crane. With the introduction of standardization the crane will be able to obtain plates on a much simpler basis. This will be by row and stack number. In each case only the top plate on the stack will be Lifted. This elimination of "digging time" will simplify the operation in the steel yard; will make production planning and control simpler in the steel yard.

PURCHASING

The purchasing effort required at present to process the ordering of 2,400 different plate types is considerable. It requires the development of steel pricing and issuing a purchase order for each different **plate.**

On the **Carlsbad** Tanker contract there are over 1,000 different plates. The current practice of buying ahead of schedule to obtain the best price would not be damaged by standardization. In fact, it should be possible to obtain lower prices by virtue of standardization. There are considerable cost benefits in quantity steel purchasing and in *restricting the* size/thickness range and this will be an added benefit. Standardization will make the purchasing activity easier and less expensive to carry out ***than*** present. For example, attachment on page shows typical pricing sheet.

	CODE NO.	82-9974	82-1353	82-9964	82-8508	82-9935	82-
	SIZE	33.15#	33.15#	33.15#	35.7#	35.7#	3
		123X466	72X372	16X360	114X466	50X396	73
1	BASE PRICE	1787	1787	1787	1787	1787	
2	WIDTH-THICKNESS	166	145	55	125	95	
3	LENGTH						
4	ODD GAGE						
5	SPECIFICATION	80	80	80	80	80	
6	CUTTING						
7	QUANTITY(VARIES)					8	
8							
9							
	TOTAL COST	2067	1922	1972	1992	1972	
		1	2	3	4	5	
	CODE NO.						
	SIZE						
	BASE PRICE						
	WIDTH-THICKNESS						
	LENGTH						
	ODD GAGE						
	SPECIFICATION						
	CUTTING						
	QUANTITY(VARIES)						
	TOTAL COST						
		1	2	3	4	5	
	CODE NO.						
	SIZE						
	BASE PRICE						
	WIDTH-THICKNESS						
	LENGTH						
	ODD GAGE						
	SPECIFICATION						
	CUTTING						
	QUANTITY(VARIES)						
	TO						

STEEL CONTROL

One of the major tasks of steel control is to match plate sizes to engineering drawings of requirements, these would include thickness and grade of steel.

The objective is to ensure the lowest percentage of scrap off each plate-hence, the existance of 2,400 different plate types, at present and essentially an infinite number yet to come.

With the introduction of standardization the work of steel control will be simplified, and would take less time, however nesting of parts onto standard sizes will have to continue.

EFFECT ON ESTIMATING

Estimators are users of information, and as such are as good as the information, available to them.

In the absence of an existing, work measurement program.* The basis of estimating in NXSSCO appears to be comparitive estimating using historical records.

Current Method of Estimating

Materials Pricing

Determine net steel weight.

1. (a) rough *estimate*
   (b) detail steel take off from contract scantling plans-by ship areal by *steel* rsquirements-i.e. grades, shapes etc.
   (c) past ship - detailed steel requirements
2. **Determine** scrap % - Net x s. f. = gross.
3. **Price out steel** - *Gross* tons x $/cwt.

* This program is being carried out but has more work to do before being able to furnish the necessary information.

LABOR

Determine net steel weight:

Bow

Stern

Midbody

- inner battoMs
- long'1
- trans
- side shell
- upper deck

Superstructure

Apply hours/ton.

The net tonnage is multiplied by a scrap factor. * to determine the gross tonnage required to be bought in order *to* manufacture the ship. The gross tonnage is the tonnage paid for by the customer and so directly affects the cost of the ship. The **lower the** percentage between the net and the gross the lower the cost.**

* Estimating state this to be *14%.* Additionally they state that this is not a precise figure.

** Source Estimating Department, this ratio ***changes*** **with** type of ship.

With the introduction of standardization the gross to net tonnage will change. Almost certainly it will increase. Because of the current method of estimating it will, on paper, increase the price of the ship. But the actual amount of scrap will not change from the present 4.71% percent certainly not as a result of standardization.

The implications of this situation is a requirement to modify the method of estimating. The present use of 14 percent does not reflect the true figure, if however, it secures contracts it should still be used even if standardization shows a difference in gross to net tonnage. From a profit/loss situation the only figure that needs monitoring is the true scrap content.

With the development of work measured values estimating will be able to use more accurate criteria for estimating.

EFFECT ON LONG RANGE PLAN

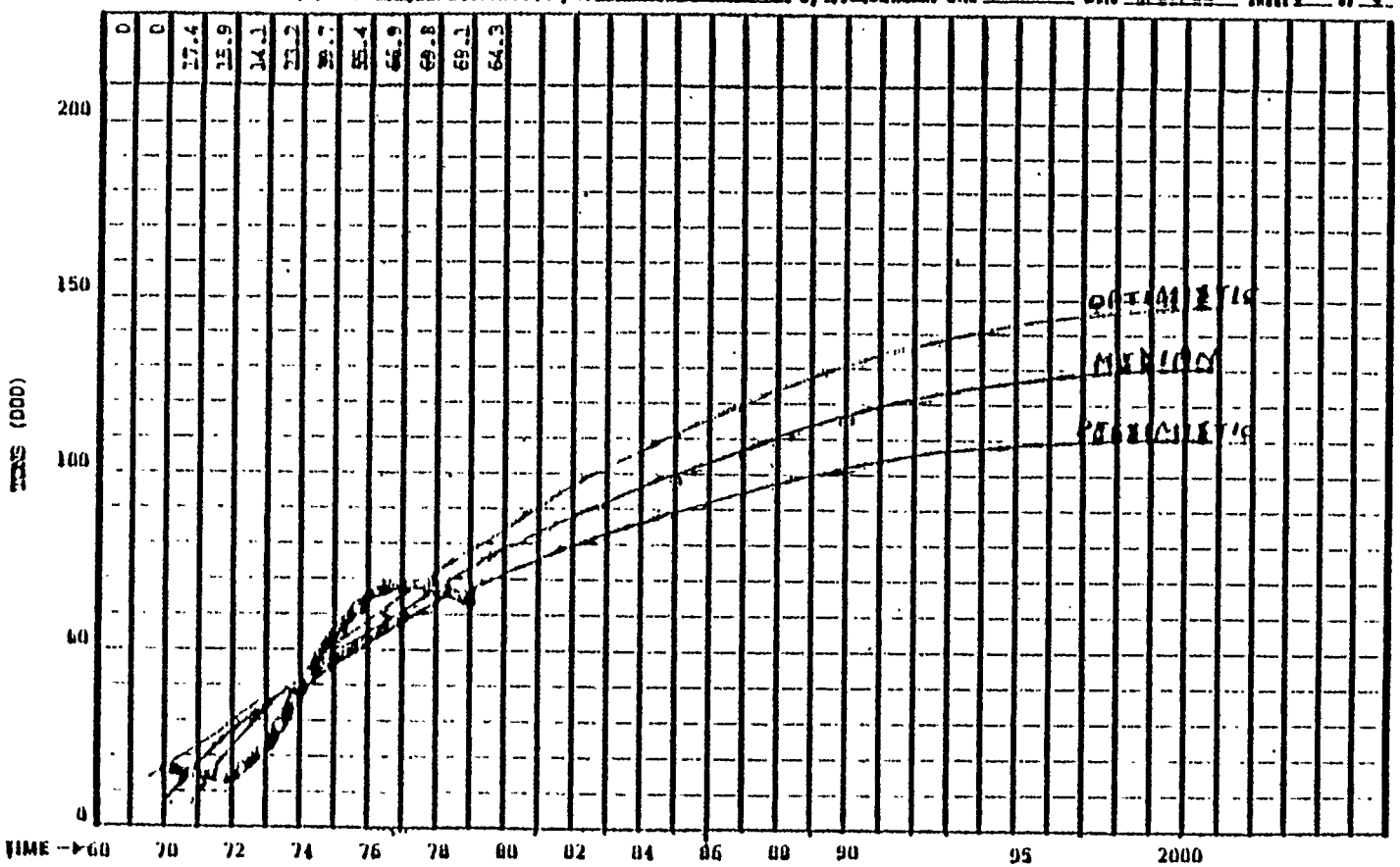
The introduction of standardization of plates in the plate yard will provide the shipyard with sufficient capacity to meet projections indicated by the Long Range Plan.

The expectation shown on the Long Range Plan indicates an increase of 100 percent over the next 20 years. It is reasonable to assume that the steelyard will be required to provide 100% percent more plates over the same time scale. Over the next twelve years the impacted tons three year rolling average * is shown as:

	000's	Percentage Increase in Output
1979	69.1	
1980	64.3	- 6.95
1981	78.0	12.87
1982	83.0	20.11
1983	88.0	27.35
1984	92.0	33.14
1985	95.0	37.48
1986	99.0	43.27
1987	104.0	50.50
1988	107.0	54.84
1989	110.0	59.18
1990	113.0	63.53
1991	116.0	67.87

* See illustration from Long Range Plan

DATA RECORD Plant PASSCO Project LIFT By J. Buricker With _____ Date 8/26/00 Sheet 1 of 1



Notation References

(a) developed using equivalent

b ship ratio based on total

c manhours per ship using SCT

(d) Impacted tons three year rolling average.

source: Impacted tons chart (a)

August 21, 1980

EQUIVALENT IMPACTED TONS

YEAR	NAVY	COMMERCIAL	TOTAL	3 YEAR ROLLING AVERAGE
1968	14,019	--	14,019	--
1969	22,824	--	22,824	--
1970	15,208	--	15,208	17,350
1971	7,464	2,281	9,745	15,925
1972	9	17,354	17,363	14,105
1973	264	42,243	42,507	23,205
1974	21,430	37,740	59,170	39,680
1975	--	64,407	64,407	55,361
1976	--	77,009	77,009	66,862
1977	12,338	55,753	68,111	69,842
1978	35,666	26,450	62,116	69,078
1979	38,951	23,731	62,682	64,303
1980	--	--	--	--

EQUIVALENT IMPACTED TONS BACKUP DATA

YEAR	TYPE VESSEL	ACTUAL TONS ACROSS PLATEN	EQUIVALENT IMPACT RATIO	EQUI
1968	AFS	734	1.86	
	LST	12,285	1.03	
1969	AFS	5,541	1.86	
	LST	12,153	1.03	
1970	LST	14,765	1.03	
1971	LST	7,246	1.03	
	Barge	4,523	.50 (est.)	
	OBO	22	.87	
1972	LST	9	1.03	
	Barge	310	.50	
	OBO	15,132	.87	
	CT	3,334	1.21	
1973	OBO	15,028	.87	
	CT	9,870	1.21	
	SCT	17,226	1.00	
	AOR	105	2.51	
1974	CT	9,664	1.21	
	SCT	26,047	1.00	
	AOR	8,538	2.51	
1975	SCT	50,831	1.00	
	CT	11,220	1.21	
1976	SCT	57,475	1.00	
	CT	5,898	1.21	
	SDT	14,415	.86	
1977	SCT	21,464	1.00	
	SDT	39,871	.86	
	AD	3,491	3.54	
1978	SDT	30,756	.86	
	AD	10,075	3.54	
1979	SDT	27,511	.86	
	CPC	35	1.30 (est.)	
	AD	11,003	3.54	

OPTION SEVEN

Standardization *of* plate stock.

RECOMMENDATION

Standardization has many advantages:

(1) Shipyard operations improved

(2) Labor cost ***on crane*** seduced

(3) Purchasing simplified

(4) Steel control simplified

(5) Crane life increased

(6) Low *cost to* implement

The disadvantages of:

(1) Restricted number of plates.

(2) Current estimating practice.

do not represent a justification to retain the current system of operation.

The overwhelming weight of evidence supports standardization.

METHOD OF STANDARDIZATION

In order to benefit *from* stanuardization certain parameters have to be identified.

(1) How many standards?

Based on the available space there should be no more than 240 standards

(2) What elements comprise a plate?

a) length
b) width
c) thickness
d) grade of material

Length and width can be determined quite simply. Thickness and grade of material are more difficult and will require discussion and analysis with design and engineering department.*

A program needs to be developed to solve the prablems that may be generated by standardization, and as with any set or rules or standards there may be exceptions. 15 this occurs in the form of, for example, a special specification, then it must be justified to whomever is given responsibility for the implementation of standardization.

Clearly here exists the loop hole through which standardization could be degraded. it is imperative that these *exceptions are thoroughly* investigated prior to approval.

Maintenance of the standardization program will require analysis of usage and review the ***changes*** in standards that are shown to be desirabls.

* There are *approximately 40 thicknesses* and 23 grades of steel in *the* yard at present.

THE WHEELABRATOR AND COLLACATOR CAPACITY

The wheelabrator operates at 9'/minutes.

This means that at best one 40' foot 14 such plates in one hour. 1,092 in a two shift 5 day week.

This output is based on plate work ***only*** and comnpares very well with the projected crane output of jobs plates per week on one shift.

The collacator cycle time is 4.0 minutes and matches the wheelabrator capacity based on 40' feet long plates.

DATE	LIFTS	STAGED	WHEELABRATOR	DOWNTIME
Thur.				
ug. 26, 1980	1,615	51	63	
1	704	22	-	
2	688	17	17	
3	-	-	-	
Wed.				
Aug. 06, 1980				
1	409	20		4.50
2	664	31	-	1.10
3	-	-	-	-
Mon.				
Aug. 04, 1980	1,173	51		
1	481	5	82	2.0
2	497	11	11	
3	452	21	-	
Fri.				
Aug. 01, 1980	1,430	37	93	
1	645	16	5	
2	636	16	57	
3	552	16	-	
Thur.				
July 31, 1980	1,833	48	62	
1	769	13	10	
2	585	17	42	3.75
3	392	13	-	
Wed.				
July 30, 1980	1,746	43	52	
1	403	14	1	.60
2	269	11	61	3.0
3	358	14	-	1.0
Tues.				
July 29, 1980	1,027	39	62	
1	598	15	7	1.50
2	496	16	61	1.75
3	293	3	-	-
Mon.				
July 28, 1980	1,387	34	68	
1	602	16	21	
2	361	7	68	
3	903	21	-	

ATE	LIFTS	STAGED	WHEELABRATOR	DOWNTIME
on.				
18, 1980	1,148	25	104	
1	601	18	-	8.0
2	465	4	-	8.0
3	583	13	-	
at.				
16, 1980	[illegible]	-		
1	572	-	-	-
2	-	-	-	-
3	-	-	-	-
ri.				
15, 1980	572			
1	182	6	11	5.0
2	540	20	82	
3	500	29	-	
hur.				
14, 1980	1,222	55	93	
1	728	13	5	
2	453	9	67	2.5
3	355	11	-	
ed.				
13, 1980	1,536	33	72	
1	577	14	15	
2	739	18	48	3.3
3	603	9	-	
ues.				
12, 1980	1,819	41	63	
1	538	10	3	
2	303	5	73	2.5
3	363	14	-	
on.				
11, 1980	1,204	29	76	
1	585	20	2	
2	600	10	81	
3	499	20	-	
ri.				
08, 1980	1,684	50	83	
1	699	18	9	
2	442	24	57	2.0
3	474	9	-	

REFERENCE E.

PIPE FOOTAGES - PAST & CURRENT

NASSCO CONTRACTS

NATIONAL STEEL AND SHIPBUILDING COMPANY

INTER-DEPARTMENT MEMO

Date June 29, 1981

To: J. Ruecker Dept.

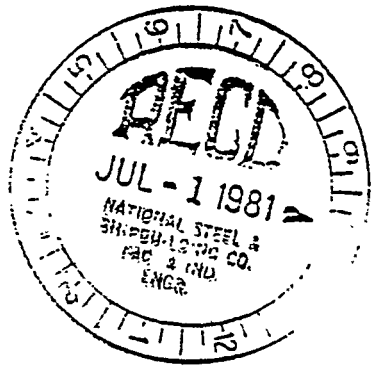
Subject: PIPE FOOTAGES-PAST & CURRENT NASSCO CONTRACTS Job No.

From: W. Sullivan Dept.

Attached find the per ship pipe quantities for the LST to present NASSCO contracts.

If you have any questions regarding the data give me a call on extension 690.

cc: R. Monastero



NASSCO BUILT SHIPS - PIPE FOOTAGES (ACTUAL AND ESTIMATED)
HISTORICAL AND CURRENT CONTRACTS

	CONTRACT	LST NAVY Bill of Mat'l (Net)	LST NAVY Drawn (Gross)	AFS NAVY Bill of Mat'l (Net)	AFS NAVY Drawn (Gross)	ARIES(J) Bill of Mat'l (Net)	ARIES(J) Drawn (Gross)
	CONTRACT SHIPS & DESIGN	17-LANDING SHIP TANK		1-COMBAT STORE SHIP		2-OIL/BULK/ORE CARRIERS	
	START CONSTR. FIRST SHIP	6/2/67		11/22/68		11/24/71	
	DELIVERY LAST SHIP	7/22/72		9/30/70		3/17/74	
	FOOTAGE SOURCE	373-P20062	WI (9/5/71)	HISTORICAL DATA		302-383 AUL	1644 AUL(w/o/20)
[illegible]	[illegible]						
[illegible]	Boilers	–				NOT AVAIL.	309 FT.
[illegible]	Propulsion Units	–					–
[illegible]	Shafting, Bearings, Props	1238 FT.	NOT AVAIL.				419.
[illegible]	Combustion Air Supply	–		–			–
[illegible]	Uptakes, Smoke Pipes, Boiler Stack	924		–			231.
[illegible]	Propulsion Control	.		8504 FT.	NOT AVAIL.		10483
[illegible]	Main Steam System	–		984			1202
[illegible]	Feed Water & Condensate	355		2433			6597
[illegible]	Circ. & Cool F & SW Systems	2658		3220			1904
[illegible]	F.O. & D.O. Service	1544		815			1149
[illegible]	Lube Oil System	4770		1487			2664
[illegible]	Heating System	9354		9257			2207
[illegible]	Ventilation System	-		–			–
[illegible]	Air Conditioning Sys.	6836		4645			351
[illegible]	[illegible] Spaces & Equip	1380		3579			578
[illegible]	[illegible] Piping Sys.	3158		1439			3175
[illegible]	Plumbing Installations	7781		8637			4867
[illegible]	Fire Sprinkling & Tank Cleaning	8234		12230			3372
[illegible]	Fire Extinguishing & Control	6307		1150			1849.
[illegible]	Bilge & Ballast Sys.	4468		4366			6034
[illegible]	F.W. & S.W. Sanitary	9203		12285			4290
[illegible]	Scuppers & Deck Drains	1800		2331			751
[illegible]	F.O. Fill & Transfer Sys.	3018		2250			2091
[illegible]	Tank Heating Sys.	-		4300			14981
[illegible]	Compressed Air Sys.	21467		7134			6959.
[illegible]	Aux Steam & Exhaust	1657		10034			7572
[illegible]	Misc. Piping Sys.	17153		6035			31979
[illegible]	Distilling Plant	1046		–			–
[illegible]	[illegible]	-		–			–
[illegible]	[illegible]	-		–			–
[illegible]	Vents, Sounding Tubes, Etc.	4004		13292			5807
[illegible]	TOTAL ONE (1) SHIP	118355 FT.		125928 FT.			121823 FT.
		✓		✓			✓

1 2 3 4 5 6 7 8 9 10 11 12 13

Code	Contract	MARGATE (K) Bill of Mat'l (Net)	MARGATE (K) Drawn (Gross)	AERON (L) Bill of Mat'l (Net)	AERON (L) Drawn (Gross)	AOR-7 (Navy) (N) Bill of Mat'l (Net)	AOR-7 (Navy) (N) Drawn (Gross)
	Contract ships designed	3 – Coronado Tanker		3 – San Clemente Tankers		1 – Auxiliary Oiler	
	Start Constr. First Ship	9/7/72		3/28/73		10/6/73	
	Delivery last Ship	2/28/75		6/25/75		10/14/76	
	Footage Source	384 7772 Run (6/14/76)		390-7772 Run (6/14/76)		393-7772 Run (4/18/78)	
One	(1) Ship Piping Systems:						
200	Boilers	215 ft.	208 ft.	614 ft.	773 ft.	115 ft.	223 ft.
201	Propulsion Units	-	-				
203	Shafting, Bearings, Props	462	331	411	385	10	21
204	Combustion Air Supply	18	14	22	25	164	164.
205	Uptakes Smoke Pipes, Outer Stacks	252	200	341	272	230	216.
206	Propulsion Control	9197	9260	9822	12073	3488	4209
207	Main Steam System	922	864	1103	1217	1977	2733.
208	Feed Water & Condensate	5478	5184.	7456	7120	9298	10052
209	Circ & Cool'g S/W Systems	1616	1625	2179	2021	5117	5692
210	F.O. & D.O. Service	1037	894	1113	1152	1533	2112.
211	Lube Oil System	2273	2477.	2215	2465	4626	4238
500	Heating System	1778	1880	2053	2186	12253	16062
501	Ventilation System	-	-	-	-	-	-
502	Air Conditioning Sys.	317	391	318	287	6771	8697
503	Refrig Spaces & Equip.	567	559.	423	377	1984	2016.
504	Cargo Piping Sys.	4210	3544	4560	4562	13150	14613
505	Plumbing Installations	4623	3705	5026	5338	11975	15707
506	Fire, Sprinkling & Tank Cleaning	2315	2296	2783	2814	17915	20350.
507	Fire Extinguishing & Control	1117	1265	1826	1917	4127	7576.
508	Bilge & Ballast Sys.	2217	1977.	3427	3460	4822	5107
509	F.W. & S.W. Sanitary	3837	3760	4245	3874	11885	11064
510	Scuppers & Deck Drains	702	423	499	497	5830	8158
511	F.O. Fill & Transfer Sys	1141.	1111	1,009	1024	2659	2653
512	Tank Heating Sys.	49912	52492	59408	66143	4439	4174
513	Compressed Air Sys.	11271.	9938	5729	5999	9863	11036.
514	Aux. Steam & Exhaust	6458	6319	7866	8848	13917.	15923
516	Misc. Piping Sys.	7170	7047	8665	7718	28284	32639
517	Distilling Plant		-	-	-	598	951
520	Boat Handling		-	-	-		
526	Inert Gas		-	-	-		
527	Vents Soundings Tubes, etc.	1653	1610	1853	5120	6747	7501
	Total One (1) Ship	120822 ft.	119608 ft.	137776 ft.	145001 ft.	183977 ft.	213905 ft.

	CONTRACT	Third Group (P) Bill of Mat'l (Net)	Third Group (P) Drawn (Gross)	Shipmar (R) Bill of Mat'l (Net)	Shipmar (R) Drawn (Gross)	Mor-Mac (S) Bill of Mat'l (Net)	Mor-Mac (S) Drawn (Gross)
	Contract ships & design	4-San Clemente THS.		4-San Clemente THS.		3-Coronado Miners	
	Start Constr. First Ship	9/9/74		3/8/76		7/29/74	
	Delivery Last Ship	11/1/76		3/15/78		2/1/77	
	Tonnage source:	375,677 MB	44 Roll	398-7772 ROll	(3/2/75)	402-7723 Roll	(6/14/76)
One	(1) Ship Foolage Pipe Systems:						
200	Boilers	Not avail.	664 Ft.	507 Ft.	627 Ft.	449 Ft.	428 Ft.
201	Propulsion Units		–	–	–	–	–
202	Shafting, Bearings, Props		448	391	372	544	591
204	Combustion Air Supply		22	20	21	6	6
205	Uptakes: Smoke Pipes Outer Stack		213	315	764	241	269
206	Propulsion Control		7823	9466	17578	7265	9453
207	Main Steam System		824	770	1296	773	781
208	Feed Water & Condensate		6761	7316	10227	5259	5874
209	Circ. & Cool. Fr & S/W Systems		2279	2536	3891	1454	1400
210	F.O. & D.O. Systems		1162	1464	1644	1087	992
211	Lube Oil System		2143	2260	2424	2173	2220
500	Heating System		1910	2188	2004	1102	1584
501	Ventilation System		–	–	–	–	–
502	Air Conditioning Sys		2789	297	304	321	389
503	Refrig. Spaces & Equip.		388	431	315	572	663
504	Cargo Piping System		4647	4226	4261	6027	6040
505	Plumbing Installations		5902	4868	4521	4273	4224
506	Fire Sprinkling & Tank Cleaning		2587	6380	6219	2275	2100
507	Fire Extinguishing & Control		1505	5745	4734	1194	1187
508	Bilge & Ballast Sys.		3521	3957	3900	1997	2053
509	F.W. & S.W. Sanitary		4019	3749	4457	3711	3647
510	Scuppers & Deck Drains		547	631	376	588	527
511	F.O. Fill & Transfer Sys		1559	1477	1561	1122	1762
512	Tank Heating Sys.		67118	58487	59097	44994	46529
513	Compressed Air Sys.		5346	6146	6261	7727	8124
514	Aux. Steam & Exhaust		7596	8398	7629	6929	6800
516	Misc. Piping Sys.		12364	15302	14640	8057	7511
517	Distilling Plant		–	–	–	–	–
523	Bow Thruster		–	–	–	–	–
524	Inert Gas		–	–	–	–	–
527	Vents, Sounding Tubes, etc.		4521	6684	6520	2162	1882
	Total One (1) Ship		148738 Ft.	157242 Ft.	171172 Ft.	115122 Ft.	116446 Ft.

Item	Comment	CHESS (V) Bill of Matl (Net)	CHESS (V) Drawing (Gross)	SHELL (W) Bill of Matl (Net)	SHELL (W) Drawing (Gross)	AFKO (X) Bill of Matl (Net)	AFKO (X) Drawing (Gross)
	COMMENT SHIPS # DESIGN	2 - SAME EQUIPMENT AS #1		2 - SAME EQUIPMENT AS #1		2 - SAME EQUIPMENT AS #1	
	Steel Const. First Ship	7/7/75		7/26/76		1/3/78	
	Delivery Last Ship	3/1/77		10/25/78		4/10/80	
	Footage Source	388-7772 dwgs (3/31/78)		405-7772 dwgs (10/13/78)		408-7772 dwgs (3/23/80)	
Dwg	(1) Ship Fastmac, Pipe Systems:						
200	Preface	701 ft	742 ft	817 ft	1037 ft.	900 ft	980 ft.
201	Propulsion Units	—	—	—	—	—	—
203	Shafting, Bearings, Props	559	477	1240	3522	1430	1456
204	Combustion Air Supply	20	5	12	0	12	43
205	Uptakes, Smoke Pipes, Air Sl	233	418	60	1454	171	140
206	Propulsion Control	9418	9576	4778	5222	4725	4768
207	Main Steam System	990	1274	1280	2509	715	1563
208	Fuel Valves & Conservato	7160	8751	9703	10845	10013	12477
209	Aux & Cool F/W & S/W Sys.	2167	1673	5220	14381	4085	4641
210	L.O. & D.O. Systems	1019	1047	2453	1884	2516	2115
211	Lube Oil Systems	2138	3611	7387	2655	2647	2819
212	Steering System	1968	1946	771	1133	991	1107
301	Ventilation System	—	—	—	—	—	—
302	Air Conditioning Sys	295	337	219	227	241	301
303	Refrig Spaces & Comp.	292	380	342	460	355	396
304	Common Piping Sys.	4624	4647	7529	7529	6796	6885
305	Plumbing, Installations	4642	4377	4000	4236	4514	4337
306	Fire Sprinkling & Tank Cleaning	2681	2566	8165	6286	7931	7946
307	Fire Extinguishing & Control	1702	1600	8367	7972	2808	2923
308	Bilge & Ballast Sys.	3572	3456	6527	4705	5048	5454
309	L.O. & S.W. Sanitary	3489	3435	3933	4687	4352	5513
310	Soundings & Deck Pipings	690	497	492	954	599	716
311	F.O.T. & Transfer Sys.	1452	1353	1581	1554	1611	1394
312	Tank Cleaning Sys	58751	60460	14940	13807	13074	14264
313	Compressed Air Sys.	5408	5282	10708	10577	9519	10677
314	Aux. Steam & Exhaust	7682	7515	10030	13343	11041	12201
316	Misc. Piping System	8117	9115	35927	33413	28244	32477
317	Distilling Plant	—	—	—	—	—	—
323	Bow Thruster	—	—	—	—	—	—
325	Diesel Gens	—	—	—	—	1954	1954
327	Tools, Soundings, Tubes, etc.	4704	5112	2986	3298	3277	3023
	Total Dwg (1) Ship	135069 ft	140036 ft	143751 ft	161432 ft	128982 ft	144042 ft

1 2 3 4 5 6 7 8 9 10 11 12 13

CONTRACT	AP's: [illegible] Bill of Mat'l (Net)	AP's Drawn (Gross)	Union Oil (F) Bill of Mat'l (Net)	Union Oil (F) Drawn (Gross)	T-ARC Bill of Mat'l (Net)	M.S.C. Drawn (Gross)
Contract Ships / Design	4 - DESTROYER TENDER		3 - [illegible] TANKERS		1 - CABLE REPAIR SHIP	
Start Constr. First Ship	[illegible]		[illegible]		[illegible]/80	
Delivery Last Ship	[illegible]/83 [illegible]		[illegible] DEL.		[illegible]/82 [illegible] DEL.	
[illegible] SOURCE	[illegible]		[illegible]		BID ESTIMATE	
(Line 6) Ship [illegible], pipe systems:						
Boilers	168	1131	5524 ft	5577 ft		
Propulsion Units	–			–		
Shafting, Bearings, Props	54	116	1	–	7174 ft	8157 ft
Combustion Air Supply	22	18	1	–		
Uptakes, Smoke Pipes, Outer Stack	110	241	51	57	955	1341
Propulsion Control	2212	3253	3137	4265	5020	8355
Main Steam System	1371	1108	1250	1271		
Feed Water & Condensate	3575	5701	8725	11730	664	1351
Fuel & Cool F/W & S/W Sys.	4453	6065	4516	4682	2161	3457
F.O. & D.O. Service	1150	3111	3356	2543	1135	1180
Lube Oil System	4165	2512	7788	4396	1161	1628
Heating System	10622	31651	1511	1168	3675	8063
Ventilation System	–		–	–		–
Air Conditioning Sys.	11710	15667	155	177	4467	15684
Refrig. Spaces & Equip.	7614	5115	2461	563	677	632
[illegible] Piping Sys.	5611	4245	1283	10533	–	–
Plumbing Installations	11165	55957	14511	1416	11017	12055
[illegible] & Tank Cleaning	22225	28567	5111	1505	2751	2751
Fire Extinguishing & Control	5600	7555	1511	1174	985	1037
Bilge & Ballast Sys.	2641	7441	6518	1223	5158	5611
F.W. & S.W. Sanitary	35067	28177	8057	1621	13110	11111
[illegible] & Deck Drains	4405	4512	708	427	680	1485
J.P.-5 & Transfer Sys.	3538	5885	733	718	2087	2212
Tank Heating Sys.	–		5342	5358	755	831
Compressed Air Sys.	41645	49105	6551	6128	6435	7653
Aux. Steam & Exhaust	17131	16117	1178	1256	1376	1532
Misc. Piping Sys.	25911	35251	5113	4125	5000	5552
Distilling Plant	1111	1110		–	66	66
Bow Thruster						
Fuel Gas		–	5271	5113	–	
Vents, Sounding Tubes, etc.	1011	1694	4155	4411	5021	5110
Pipe Allocation		1256				
				[illegible]		
One (1) Ship	207166	312611	73210 ft	77653 ft	145531 ft	215611

NOTE: [illegible]

	CONTRACT	AMERICAN BILL OF MINE (NET)	MILLSHIP(1) DRAFT (GROSS)	AMERICAN BILL OF MINE (NET)	MINOTC (3) DRAFT (GROSS)
	CONTRACT SHIPS DESIGN				
	START CONST. FIRST SHIP				
	DELIVERY LAST SHIP				
	TONNAGE SOURCE				
	(1) SHIPYARD PRESENT				
	NOTES				
	PROPULSION UNITS				
	SHAFTING, REDUCING GEARS				
	COMBUSTION AIR SUPPLY				
	BOILERS				
	PROPULSION CONTROL				
	MAIN STEAM SYS.				
	FEEDWATER & CONDENSATE				
	MAIN STEAM & EXH. SYSTEMS				
	F.O.T.D.O. SERVICE				
	LUBE OIL SYSTEM				
	HEATING SYSTEM				
	STEAM SYSTEM				
	MAIN CONDENSING SYS.				
	MAIN SPACE EQUIPMENT				
	CARGO PIPING SYS.				
	PLUMBING INSTALLATION				
	FIRE, SPRIN, & FIRE DET.				
	MAIN & EMER. CONTROL				
	BILGE & BALLAST SYS.				
	F.O. & S.W. SERVICE				
	SEWAGE & TRASH DISPOS.				
	AIR CONDITIONING				
	MAIN HEATING SYS.				
	COMPRESSED AIR SYS.				
	AUX. STEAM EQUIPMENT				
	MISC. PIPING SYSTEMS				
	DISTILLING PLANT				
	ASW EQUIPMENT				
	FLIGHT GAS				
	CRANES & BOOMING GEAR				
	LEAD ONE(1) SHIP				
	NOTES: (1) SHIPYARD EST. AT 4%				
	(2) DRAFT AT CONSTANT				